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The Premium System for the Payment of Wages.

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Although the premium method of wage payment is rapidly gaining ground in the United States, it is nevertheless surprising how imperfectly it is understood by many manufacturers as well as accountants.

The object of this article is to illustrate some of the best known methods, and by commenting upon them, to draw attention to the advantages or disadvantages of each, to the end that an employer or accountant contemplating the installation of the premium system in a shop, may obtain a fairly thorough knowledge of various methods in use, and so be in a position to decide which plan will best meet the requirements of his particular case. The article has principally to do with the methods used in calculating the premium but at the end a simple system will be illustrated and explained which, although designed specifically for a machine shop, is readily adaptable to almost any kind of manufacturing business.

A brief description of the general principles involved, for the benefit of those who may still be unfamiliar with this method of remunerating labor, is probably all that will be necessary for the purposes of this article, before starting in to comment upon specific systems.

Under the premium system the workman receives his regular hourly rate of wages no matter how long he takes to perform an operation, but if he succeeds in accomplishing the work in less than a specified "Standard Time," he receives in addition to his wages a premium, or bonus, based upon the time saved.

Evolution of the Premium System.

Mr. F. W. Taylor, some twenty-five years ago, was the first to go about the gathering of statistics and the classification of data in respect to shop operations, in a scientific manner. From this data he was able to determine the best and most economical methods to use, and to formulate instructions which tended greatly to increase the efficiency of the workmen and tools. In brief, his method was to determine by means of his data the time in which an operation should be done, the best methods and tools to employ to enable it to be done, and then to see that it was done in the manner and time established. His method placed the responsibility of increasing the efficiency of the workmen almost entirely upon the management, although a higher rate of pay, or piece rate, was allowed for high efficiency. Practically all the premium methods of remunerating labor are the outgrowth of Mr. Taylor's ideas.

In 1891, in a paper read before the American Society of Mechanical Engineers, Mr. F. A. Halsey described a premium system devised by him, of which all later systems are merely modifications. Under this system a Standard Time is established for an operation and any saving is divided in some proportion between the employer and employee.

Mr. James Rowan, of Messrs. David Rowan & Sons, Glasgow, Scotland, in a paper read before the Mechanical Section of the International Engineering Congress, held at Glasgow in 1901, advocated a system of payment upon a sliding scale basis. This plan allows the workman as a bonus the same proportion of his regular wages as the time saved bears to the time allowed, or Standard Time.

One of the most novel systems is the so-called "Sante Fe, or Emerson, System," in use on the Sante Fe Railroad. Mr. Emerson sets a Standard Time in which an operation *ought to be done*, which he calls 100% efficiency, and for which 20% bonus is paid. The workman receives a small bonus beginning with 66 2/3% efficiency, and a high and rapidly increasing premium beyond efficiency.

These systems, as well as others, will be illustrated and more fully described further on.

The Premium System for the Payment of Wages.

Day Work, Piece Work and Premium Plans Compared.

Day wages is the most expensive and least satisfactory method of remunerating labor, because there is little or no incentive for a workman to do his best, and shops using this method are almost without exception operating on a very low percentage of efficiency. The piece work plan has also proved unsatisfactory. Under this system the workman receives all the direct saving, the only benefit accruing to the employer being the lower expense burden per unit of output. By constant repetition of the same work, operatives are in many instances able to reduce the time to such an extent, and their wages become so exorbitant, that the piece rates are cut, which is sure to cause dissatisfaction and often demoralization. Employees soon become aware of this and confine their output within limits which they consider safe. Under the premium system, the saving being divided between the employer and employee, there is less temptation to cut rates, and if sufficient care has been exercised in establishing the Standard Times, there should be no occasion for altering them, unless in the event of some radical change in tools or method of manufacture.

An argument frequently advanced against both the piece work and premium plans is that they tend to lower the quality of the work. This is obviously true, but may be overcome by a rigid system of inspection involving penalties for inferior workmanship.

Advantages of the Premium System.

Factory operatives are apt to get into a rut. They become accustomed to doing their work in a certain way and in a certain time, and in the absence of any incentive, become mere adjuncts of the machines they operate. Of course, they are not alone in this respect—even bookkeepers have been known to suffer from the same sort of "sleeping sickness." Given, however, a sufficiently attractive inducement to exercise their latent intelligence, it is surprising what they can accomplish in the way of devising ingenious methods to shorten the time of operations. Instances are common in which the minimum time for an operation under the old methods has been reduced one-half, two-thirds, and even more. Superintendents and foremen, who, of course, should share

in the benefits due to the saving of time—as will be explained further on—naturally will use their best efforts towards increasing the efficiency of the workmen and machinery, and in fact the premium system acts as a healthful stimulant to the entire shop organization. "Wages go up and costs go down."

It is scarcely necessary to say that extreme care should be exercised in establishing Standard Time, but the inducement must be sufficiently great to tempt the workmen to try for it. Once fixed, it should only be revised in case of a change in the method of manufacture, such as in the event of the installation of an improved tool, or the increase in efficiency of the old tool due to a change in power, speed, or other reason outside of the efforts of the workman himself. Of course, there are exceptions to all rules, and under exceptional circumstances a Standard Time may be reduced in safety, if at the same time the workman's regular rate of wages be increased so that he can make as much as he did before. In case he is later replaced, or other workmen are hired for the same operation, the regular rate of wages paid would again prevail, and thus the matter will adjust itself, usually without any friction.

In establishing a Standard Time for the performance of an operation, a record of the time actually taken by various workmen during a certain period should be kept; but to rely upon this information alone would be insufficient and dangerous unless it be supplemented by careful observation and experiment. By "observation" is meant the systematic watching of the workmen at their tasks, for the purpose of forming an opinion as to what extent they are using their best efforts, and by "experiment," the employing of an expert workman on that particular operation in order to ascertain in what period of time he can perform the operation with all conditions favorable and using the best of tools. With these data at hand it should not be difficult to fix a Standard Time which will be fair to both parties concerned.

In addition to the saving in labor consequent upon the lessening of time for the performance of an operation, the reduction in the factory expense burden apportionable to it should not be overlooked. This is shown in the following example in which the workman is assumed to receive as a premium one-third of the time saved, his regular rate of wages being 30 cents an hour and the Standard Time 10 hours.

Hours Worked	Earnings at Reg. Rate	Burden at 200 Per Hour	Premium Earned	Cost	Earnings Per Hour	Per Cent. Saved
10	$3.00	$2.00	...	$5.00	$0.30	....
9	2.70	1.80	$0.10	4.60	.311	8%
8	2.40	1.60	.20	4.20	.325	16%
7	2.10	1.40	.30	3.80	.343	24%
6	1.80	1.20	.40	3.40	.366	32%
5	1.50	1.00	.50	3.00	.40	40%

Thus if a workman succeeds in saving half the time—which, by the way, is not at all unusual—he increases his wages 10 cents an hour (33 1/3%) and the operation, which originally cost $5.00 with the burden added, now costs $3.00, or a saving of $1.00 in labor and $1.00 in factory burden.

Various Premium Methods.

A number of different premium plans will now be illustrated, and the good or bad features of each commented upon:

Halsey Method (A).

Workman to receive one-half of time saved.

Standard Time—10 Hours.

Hours Worked	Regular Rate	Earnings at Reg. Rate	½ Time Saved	Premium Earned	Total Earnings	Earnings Per Hour
10	.....	$3.00	.....	.....	$3.00	$0.30
9	$0.30	2.70	½ hr.	$0.15	2.85	.316
8	.30	2.40	1 "	.30	2.70	.337
7	.30	2.10	1½ "	.45	2.55	.364
6	.30	1.80	2 "	.60	2.40	.40
5	.30	1.50	2½ "	.75	2.25	.45
4	.30	1.20	3 "	.90	2.10	.525
3	.30	.90	3½ "	1.05	1.95	.65
2	.30	.60	4 "	1.20	1.80	.90
1	.30	.30	4½ "	1.35	1.65	1.65

This method is all right up to the point where a workman succeeds in cutting the time in half, beyond which his hourly rate of pay increases rapidly and his wages become so high that the employer is tempted to cut the Standard Time established, which is pretty certain to result disastrously. Instances have occurred in which a workman has succeeded in cutting such a slice from the Standard Time, and his wages have thereby increased so enormously, that he has been able to employ a helper, thus delivering some work in zero time. He may also work on his own time, before or after hours, or in some lines of manufacture, he may take work home and thus deliver it in zero time so far as the shop is concerned.

For the reason, therefore, that it may render it possible for an

operative to earn excessive wages, the above plan is not recommended in its entirety.

No. 2.

HALSEY METHOD (B).

Workman to receive one-third of time saved.

Standard Time—10 Hours.

Hours Worked	Regular Rate	Earnings at Reg. Rate	⅓ Time Saved	Premium Earned	Total Earnings	Earnings Per Hour
10	$0.30	$3.00	.....	.....	$3.00	$0.30
9	.30	2.70	⅓ hr.	$0.10	2.80	.311
8	.30	2.40	⅔ "	.20	2.60	.325
7	.30	2.10	1 "	.30	2.40	.343
6	.30	1.80	1⅓ "	.40	2.20	.366
5	.30	1.50	1⅔ "	.50	2.00	.40
4	.30	1.20	2 "	.60	1.80	.45
3	.30	.90	2⅓ "	.70	1.60	.533
2	.30	.60	2⅔ "	.80	1.40	.70
1	.30	.30	3 "	.90	1.20	1.20

This method is good up to the point where a workman is able to save two-thirds of the time, after which his hourly rate and wages become excessive. It is, therefore, open to criticism for the same reason advanced against plan No. 1, although to a lesser degree.

No. 3.

ROWAN METHOD.

Workman to receive same per cent. of regular time as time saved bears to time allowed.

Standard Time—10 Hours.

Hours Worked	Regular Rate	Earnings At Reg. Rate	Time Saved	% of Time Saved To Time Allowed	Premium on Basis of Same % of Reg. Time	Total Earnings	Earnings Per Hour
10	$0.30	$3.00	....	....	.....	$3.00	$0.30
9	.30	2.70	1 hr.	10%	$0.27	2.97	.33
8	.30	2.40	2 "	20%	.48	2.88	.36
7	.30	2.10	3 "	30%	.63	2.73	.39
6	.30	1.80	4 "	40%	.72	2.52	.42
5	.30	1.50	5 "	50%	.75	2.25	.45
4	.30	1.20	6 "	60%	.72	1.92	.48
3	.30	.90	7 "	70%	.63	1.53	.51
2	.30	.60	8 "	80%	.48	1.08	.54
1	.30	.30	9 "	90%	.27	.57	.57

This plan is objectionable for the reason that it permits a workman to earn too large a premium in the beginning; that is, for a small saving of time. It will be seen that his wages would increase 10% for every hour saved, so that if he succeeds in saving two hours his wages would increase by 20%; a saving of three hours would result in an increase of 30%, and so on.

The above method is a desirable one from the employer's point of view when the saving is large, and it will be noted that under this plan a workman could never succeed in more than doubling his wages. Up to a saving of half the time it is in favor of the workman; beyond that point it favors the employer.

No. 4.
Cardullo Method.

Establishing a Maximum Rate which a workman cannot exceed no matter how much time he saves. In this example the Maximum Rate is fixed at 50 cents per hour. By fixing the maximum at double the minimum (60 cents in this case), it is exactly the same as the Rowan Method.

Standard Time—10 Hours.

Hours Worked	Regular Rate	Earnings at Reg. Rate	Time Saved	Premium Earned	Total Earnings	Earnings Per Hour
10	$0.30	$3.00	.....	.....	$3.00	$0.30
9	.30	2.70	1 hr.	$0.18	2.88	.32
8	.30	2.40	2 "	.32	2.72	.34
7	.30	2.10	3 "	.42	2.52	.36
6	.30	1.80	4 "	.48	2.28	.38
5	.30	1.50	5 "	.50	2.00	.40
4	.30	1.20	6 "	.48	1.68	.42
3	.30	.90	7 "	.42	1.32	.44
2	.30	.60	8 "	.32	.92	.46
1	.30	.30	9 "	.18	.48	.48

This method the writer does not favor for the same reason advanced against the Rowan plan—unless the maximum rate is fixed very low—it permits an excessive premium to be earned in the beginning. Another objectionable feature is that the method of calculating is too complicated for the ordinary workman readily to understand. For instance, Mr. Cardullo's formula for calculating the rate to be paid for a saving of two hours, when the minmum rate is 30 cents and the maximum 50 cents (as above) is as follows:

$$30 \times \left\{ \frac{2}{1 + 1.5 \times 10} \right\} = 34$$

A simpler way, seemingly, would be to divide the difference between the maximum and minimum rates (20 cents) by the Standard Time (10 hours), which gives 2 cents as the increase in rate for every hour saved.

As stated above, if the maximum time is fixed at double the minimum, there is no difference between this and the Rowan method. If fixed at less than double, the inducement would seem

to be insufficient for a large saving of time, and if fixed at double, or more, it admits of too high a rate of wages for a small saving of time.

No. 5.

SANTA FE, OR EMERSON, METHOD.

A Standard Time is set in which the work *ought* to be done. If done in Standard Time the workman is rated at 100% efficiency. Premium begins at 66 2/3% efficiency and increases gradually until Standard Time, or 100% efficiency, is reached, at which point the premium allowed is 20% of wages. Thereafter it increases at the rate of 1% for every 1% increase in efficiency.

Standard Time—6 Hours 40 Minutes.

Hours Worked	Regular Rate	Earnings at Reg. Rate	Efficiency Per Cent.	Premium Earned	Total Earnings	Earnings Per Hour
10	$0.30	$3.00	67%	.....	$3.00	$0.30
9	.30	2.70	74%	$0.03	2.73	.303
8	.30	2.40	83%	.12	2.52	.315
7	.30	2.10	95%	.31	2.41	.344
6	.30	1.80	111%	.56	2.36	.393
5	.30	1.50	133%	.80	2.30	.46
4	.30	1.20	167%	1.04	2.24	.56
3	.30	.90	222%	1.28	2.18	.726
2	.30	.60	333%	1.52	2.12	1.06
1	.30	.30	667%	1.76	2.06	2.06

This system, in use on the Santa Fe Railroad, requires a rather elaborate premium department, and extreme care is necessary in the fixing of Standard Time. A small and gradually increasing premium is paid, beginning with 66 2/3% efficiency, until Standard Time, or 100% efficiency, is reached, after which the premium increases very rapidly.

Under this system an efficiency record is kept for each workman, and he is not paid a premium on individual jobs, but upon his average efficiency for all jobs upon which he has been employed during the month.

The above method would seem to be altogether too elaborate and complicated for an ordinary workman to comprehend. It is also faulty, in the writer's opinion, for the reason that it permits the earning of far too large a premium for work accomplished in less than Standard Time.

No. 6.

S. & N. METHOD (A).

(A combination of the Halsey and Rowan Plans.)

Workman to receive one-half of time saved until saving

reaches 50%, and thereafter the same per cent. of regular time as time saved bears to time allowed.

Standard Time—10 Hours.

Hours Worked	Regular Rate	Earnings at Reg. Rate	Premium Allowance	Premium Earned	Total Earnings	Earnings Per Hour
10	$0.30	$3.00	.....	.....	$3.00	$0.30
9	.30	2.70	½ hr.	$0.15	2.85	.316
8	.30	2.40	1 "	.30	2.70	.337
7	.30	2.10	1½ "	.45	2.55	.364
6	.30	1.80	2 "	.60	2.40	.40
5	.30	1.50	2½ "	.75	2.25	.45
4	.30	1.20	60%	.72	1.92	.48
3	.30	.90	70%	.63	1.53	.51
2	.30	.60	80%	.48	1.08	.54
1	.30	.30	90%	.27	.57	.57

This combination of the Halsey and Rowan methods is favored by the writer for the reason that the good features of each are retained, while the bad features are eliminated. Under this plan the workman may be allowed one-half the saving, or any percentage of it which may be decided upon. On the basis of one-half the saving—as above—the Halsey plan is followed up to a saving of one-half the time, from which point the Rowan method is used. If allowed one-third the saving, the plan changes when a two-thirds saving has been effected, as illustrated under the following schedule—No. 7.

No. 7.

S. & N. Method (B).

(A combination of the Halsey and Rowan Plans.)

Workmen to receive one-third of time saved until saving reaches 66 2/3%, and thereafter the same per cent. of regular time as time saved bears to time allowed.

Standard Time—10 Hours.

Hours Worked	Regular Rate	Earnings at Reg. Rate	Premium Allowance	Premium Earned	Total Earnings	Earnings Per Hour
10	$0.30	$3.00	.....	.....	$3.00	$0.30
9	.30	2.70	⅓ hr.	$0.10	2.80	.311
8	.30	2.40	⅔ "	.20	2.60	.325
7	.30	2.10	1 "	.30	2.40	.343
6	.30	1.80	1⅓ "	.40	2.20	.366
5	.30	1.50	1⅔ "	.50	2.00	.40
4	.30	1.20	2 "	.60	1.80	.45
3	.30	.90	70%	.63	1.53	.51
2	.30	.60	80%	.48	1.08	.54
1	.30	.30	90%	.27	.57	.57

Superintendents and Foremen.

Obviously, it is good policy to allow the superintendent and foremen to share in the increased earnings due to the saving of time. An equitable method is that which allows the superintendent as a bonus a proportion of his salary in the same ratio that the total saving in the entire shop bears to the total pay-roll Likewise each foreman should receive a bonus calculated in the same manner based upon the percentage that the saving in his department bears to the total pay-roll of that department.

This would seem to be a fair arrangement and is an incentive to the superintendent and foremen to assist in making the premium system a success, and to accelerate the work in the various departments in every way possible.

In order that comparison may easily be made of the results produced by the several plans illustrated herein, a "Summary of Various Premium Methods" is here given, which will be found of interest.

A Simple Premium System.

A set of forms for a premium system will now be reproduced and explained. This system, although designed primarily for a machine shop, can easily be adapted to almost any line of manufacture, and, of course, may be elaborated to any extent desired.

Form No. 1. Workman's Daily Time Card.

This is gotten up in coupon form so that the sections may be separated and sorted to different order numbers or operations. The time of starting is shown by a stroke of the pencil through the figures indicating the hour and minute in the upper half of a section, and the time of finishing is shown in the same manner in the lower half. It is immaterial whether the time is taken by a time-keeper or filled in by the workman himself. If by the latter, the card is turned over to the foreman at the end of the day's work for his approval, which he indicates by a punch in the column headed "R. Work," if the workman is employed on regular day work, or in the column headed "P. Work" if he is on premium time. The card then goes to the cost or time-keeping department. This is an excellent form of time card for general use, whether a premium system is in operation or not.

Form No. 1. WORKMAN'S DAILY TIME CARD. Size 4" x 7½"—Perforated.

No. NAME DATE 191 DEPT.

Order No.	Part or Symbol and Operation	Time Started and Finished	Hours	Rate	Amount	Foreman's Punch	
		Start: Hr. 6-7-8-9-10-11-12-1-2-3-4-5-6 Min. 6-12-18-24-30-36-42-48-54				R. Work	P. Work
		Finish: Hr. 6-7-8-9-10-11-12-1-2-3-4-5-6 Min. 6-12-18-24-30-36-42-48-54					

No. NAME DATE 191 DEPT.

Order No.	Part or Symbol and Operation	Time Started and Finished	Hours	Rate	Amount	Foreman's Punch	
		Start: Hr. 6-7-8-9-10-11-12-1-2-3-4-5-6 Min. 6-12-18-24-30-36-42-48-54				R. Work	P. Work
		Finish: Hr. 6-7-8-9-10-11-12-1-2-3-4-5-6 Min. 6-12-18-24-30-36-42-48-54					

No. NAME DATE 191 DEPT.

Order No.	Part or Symbol and Operation	Time Started and Finished	Hours	Rate	Amount	Foreman's Punch	
		Start: Hr. 6-7-8-9-10-11-12-1-2-3-4-5-6 Min. 6-12-18-24-30-36-42-48-54				R. Work	P. Work
		Finish: Hr. 6-7-8-9-10-11-12-1-2-3-4-5-6 Min. 6-12-18-24-30-36-42-48-54					

USE A SEPARATE SECTION FOR EACH ORDER AND FOR OVERTIME

SUMMARY OF VARIOUS PREMIUM METHODS.

Day Wages			No. 1 Halsey Method (A)			No. 2 Halsey Method (B)			No. 3 Rowan Method			No. 4 Cardullo Method			No. 5 Santa Fe or Emerson Method			No. 6 S. & N. Method (A)			No. 7 S. & N. Method (B)		
Hours	Reg. Rate	Earnings at Reg. Rate	Prem. Earned	Total Earnings	Earnings Per Hour	Prem. Earned	Total Earnings	Earnings Per Hour	Prem. Earned	Total Earnings	Earnings Per Hour	Prem. Earned	Total Earnings	Earnings Per Hour	Prem. Earned	Total Earnings	Earnings Per Hour	Prem. Earned	Total Earnings	Earnings Per Hour	Prem. Earned	Total Earnings	Earnings Per Hour
10	.30	$3.00		$3.00	.30		$3.00	.30		$3.00	.30		$3.00	.30		$3.00	.30		$3.00	.30		$3.00	.30
9	.30	2.70	.15	2.85	.316	.10	2.80	.311	.27	2.97	.33	.18	2.88	.32	.03	2.73	.303	.15	2.85	.316	.10	2.80	.311
8	.30	2.40	.30	2.70	.337	.20	2.60	.325	.48	2.88	.36	.32	2.72	.34	.12	2.52	.315	.30	2.70	.337	.20	2.60	.325
7	.30	2.10	.45	2.55	.364	.30	2.40	.343	.63	2.73	.39	.42	2.52	.36	.31	2.41	.344	.45	2.55	.364	.30	2.40	.343
6	.30	1.80	.60	2.40	.40	.40	2.20	.366	.72	2.52	.42	.48	2.28	.38	.56	2.36	.393	.60	2.40	.40	.40	2.20	.366
5	.30	1.50	.75	2.25	.45	.50	2.00	.40	.75	2.25	.45	.50	2.00	.40	.80	2.30	.46	.75	2.25	.45	.50	2.00	.40
4	.30	1.20	.90	2.10	.525	.60	1.80	.45	.72	1.92	.48	.48	1.68	.42	1.04	2.24	.56	.72	1.92	.48	.60	1.80	.45
3	.30	.90	1.05	1.95	.65	.70	1.60	.533	.63	1.53	.51	.42	1.32	.44	1.28	2.18	.726	.63	1.53	.51	.63	1.53	.51
2	.30	.60	1.20	1.80	.90	.80	1.40	.70	.48	1.08	.54	.32	.92	.46	1.52	2.12	1.06	.48	1.08	.54	.48	1.08	.54
1	.30	.30	1.35	1.65	1.65	.90	1.20	1.20	.27	.57	.57	.18	.48	.48	1.76	2.06	2.06	.27	.57	.57	.27	.57	.57

FORM NO. 2.

OPERATION RECORD

Name of Part _____ Mach. No. _____

Machine _____ Symbol _____ No. _____ Weight _____

Operation _____ Operation No. _____

On Machine No. _____ Dept. _____ Stand. Time _____ Date Est. _____

Remarks _____

Date	Order No.	Workman	No.	Rate	No. Pcs.	Time Required	Unit Time	Remarks

Form No. 2.

Size 5″ x 8″.

This card is for use in the collecting of information respecting the time required for the performance of any particular operation, for the purpose of establishing a Standard. It may be used prior to the installation of a premium system or subsequently thereto, whenever it is desired to obtain such a record.

Form No. 3.

Size 5″ x 8″.

This card is designed to contain a list of all the operations on a specific article, or part, with the Standard Time established for each. Every operation is numbered and they should follow on the card in the same order that they naturally occur during the progress of the article through the shop. As soon as a Standard Time for a certain operation has been established by means of the Operation Record, Form No. 2, it should be entered in its proper place on the Master Card, which provides a convenient and quick reference for the Standard Time established for any operation. In case the same operation is performed on several machines of different design, or varying rates of speed, it will be necessary to establish a Standard Time for each. The operation should bear the same index number no matter what machine is used, so that on the Master Card there might be, for instance, two or more entries under Operation No. 2, covering the several machines on which the operation may be performed. The Operation No. is, of course, qualified by the Machine No., as, for example—Operation No. 2 on Machine No. 15; Operation No. 2 on Machine No. 16; etc.

FORM NO. 3.

MASTER CARD

Name of Part _____ Mach. No. _____

Machine _____ Symbol _____ No. _____ Weight _____

Remarks _____

Op. No.	Operation	Dept.	On Mach. No.	Stand. Time	Remarks

FORM NO. 4.

WORKMAN'S PREMIUM TIME CARD

Order No. _____

Workman's No. _____ **Name** _____

Part or Symbol _____

_____

Operation _____

_____

Operation No. _____ **Dept.** _____

On Mach. No. _____ **No. Pcs.** _____ **Weight** _____

Date		Time From	Time To	Hours		Pcs.	✓	Foreman

Form No. 4.

4" x 7½".

These cards should be padded at the top and made up in sets of original and duplicate for use with carbon paper—original of fairly thin paper and duplicate of card stock. When a workman is about to start on a premium job, the card is filled out as indicated thereon and the duplicate given to him, which, of course, contains the Standard Time allowed for the operation. On the original, retained by the cost or time-keeping department, the time is entered daily from the regular daily time cards—Form No. 1. The workman fills in his time on the duplicate and has it approved by the foreman who punches in the space provided. As soon as the job is completed and the work is inspected and approved, the card goes to the time-keeping department where it is compared with the original and is then entered on the Workman's Premium Record, Form No. 5.

Form No. 5.

Size 5" x 8".

Postings to this card are made from Form No. 4 and constitute a valuable record of the efficiency of each workman. At the end of a pay period the column headed "Premium Amount" should be ruled off and the total premium earnings for the period extended in the column to the right headed "Pay Period Totals," from which it is transferred to the payroll. Entries of all premium earnings on the payroll should be made in red ink and if paid in currency it is a good idea to enclose the premium earnings in a separate envelope.

A separate card should be kept for each department; that is, if a workman happens to be employed during a period in two

FORM NO 5.

WORKMAN'S
PREMIUM RECORD

No. _____ Name _____ Dept. _____

Date Finished	Order No.	Op. No.	On Mach. No.	Standard Time	Time Taken	Time Lost	Time Saved	Premium Allowance	Rate	Amount Premium	Pay Period Totals	✓

departments, two Premium Record cards should be kept for him. This is in order that the amount of premiums earned and the total saving in each department may be easily ascertained.

The forms reproduced herein illustrate those required for a very simple system. Others of a subsidiary, or auxiliary, character may be added from time to time, or changes may be made to meet individual requirements. A good cost-system already in use is naturally a very material aid in the installation of a premium system, and renders the work much easier of accomplishment.

The Continuity of Interest.

By Charles E. Sprague, Ph.D., C. P. A.

The traditional definition of interest is "money paid for the use of money." This is so defectiv and misleading that I suggest as a substitute the following: *Interest is the increase of an indebtedness by reason of the lapse of time.*

I maintain that interest is a force operating solely upon indebtedness and to an extent mesured by time alone.

The old definition is not only silly but harmful. Whatever interest may be—a service or a preference—it is not money, any more than electricity can be defined as money paid to the Edison Company. And the old definition inculcates the false doctrin that interest, or any other profit-and-loss entry can originate in the cash (except in the one case of embezzlment, or error). The payment of cash is always a liquidation of indebtedness or a creation of indebtedness. For convenience we often suppress mention of the creation and the liquidation of the indebtedness, both of them; but as a matter of theory, both exist. To represent the culmination of a growth as being an instantaneous and fortuitous dropping of coin and currency into the till is unphilosophical. During five months and twenty-nine days nothing has changed; in one day, at one moment of the day, in the twinkling of an eye, the proprietor has suddenly acquired welth, altho this acquisition really extends over all the time, and cumulativly.

Yet, "Cash Dr. to Interest" is in the books of many great corporations whose chief business is the earning and distribution of interest, and is the only entry to represent their main source of profit, as if it were not progressivly earnd but dropped like the gentle dew from heaven, just as it might chance. This defectiv accounting has caused accrued interest, payable or receivable, to be ignored in the accounts and omitted from the balance-sheets. Up to this day, in many such institutions, the vital fact of the *earning* of interest is absolutely unrecorded and only the *collection* of interest, its extinction or transformation, is mentioned. Accrued interest has, however, been compulsorily inserted in the lists of assets and liability required by governmental authority; and even then we find the current accounts breathing nothing of it, but it is made up by calculation "in the air."

What then is interest, and where does it take effect? An examination of all cases involving interest will show us that interest is possible only in case of the existence of a debt. No interest can accrue except against a debtor and in favor of a creditor, and it always effects an increase of indebtedness on the one side and of proprietorship on the other. Interest is an increase of indebtedness, not an increase or decrease of cash.

We next inquire what is the cause or the force which works this increase. It is simply the lapse of time, and nothing else. If the time is zero, the interest is zero. A sum payable *now*, is worth its face, or par. But every human being prefers, for various and mixt reasons, to have a dollar today rather than the assurance of a dollar one year from today. This is the essence of interest, and the amount of this preference for each dollar is the increase of the debt.

Thus, I think, we may safely say that, *Interest is the increase of an indebtedness by reason of the lapse of time,* and adopt this provisionally as a definition. I hope a better one may be devised, but I am sure in the meantime that this is better than any based upon "cash paid."

In this theory of interest it is assumed that it is a constant force, which I think is not denied by those who call it "money paid," etc. The prescribed periods of payment are merely prudential, lest the indebtedness become too great for the margin of security and are intended to bring the indebtedness back, *at intervals,* to its original figure. Yet in the interval the indebtedness does exceed that figure and grows until the prescribed date, and should, equitably, keep on growing till the actual payment. Practically, in the present state of the law, this is not enforced.

The rate is fixt by agreement in any given indebtedness, yet it is governed by competition and by various considerations of security, necessity and so forth, which make the preference for today's over tomorrow's possession greater or less, "raising" and "lowering" the rate. The rate is necessarily limited by some time-unit and the selection of this time-unit is more important than might at first appear.

The most elementary phase in which interest can be viewd is that of *punctual interest,* a species not generally mentioned. In this, the interest accrued during the period, or time-unit and on the last day is paid off, restoring the principal to its original figure.

There is no question of compounding or not compounding; the contract calls for such increase of the debt as shall at the end of a time-unit have reacht so many cents on each dollar and that then there shall be so much cash paid on account of the debt as will restore it to what it was at the beginning. What the indebtedness will amount to at any intervening date or what it will amount to if the payment is delayed and runs over into the next time-unit are academic questions which no one asks and no one answers.

As the increase is silent while the money-payment is demonstrativ, no wonder that many have supposed that the noisy cash was the one that does the work and even eminent lawyers and judges have mistaken effect for cause.

But this infantile simplicity will not answer when we attempt to solve problems of finance where there is no entire settlement periodically but where many units of time, many years must be the subjects of forecast and prevision. Then cash payments form no criterion; there is no "money paid for the use of money," or if there is, it does not mesure the true interest. Interest is ideal, but not the less actual altho not evidenced by check or coin. It is a growth of indebtedness.

Coupons are not interest. This was severally brought home to a great financial corporation which, having invested a large trust estate in high premium bonds, paid over to the life tenant the full proceeds of each coupon, thus depleting the estate and being compeld to make restitution to the remainder-man.

When we extend beyond the single period, compound interest is recognized. If the contract calls for six per cent. per annum, the amount of the debt at the end of the first year is 1.06 and at the end of the second year is 1.06^2 or 1.1236, and so on proceding by *powers* of 1.06. Let us suppose that the time-unit is two years, and the rate 12 36/100 per biennium. What is the debt at the end of the first year or half-term? 1.06, or the square root of 1.1236; reversing the process, the debt at the half-period is the full square root of that at the full period.

As applied to fractional periods this principle is not yet thoroly understood by the many. If a debt of $1,000,000 at six per cent. per annum were due at the end of the year with the privilege of paying off at the mid-year, nine out of ten, even in Wall Street, State Street or Milk Street, would say that the equitable interest would be $30,000, whereas it should be $29,563.01.

The Continuity of Interest.

When it is thoroly understood that interest works continuously and on a constantly increasing principal; that compound interest operates during the period and not merely at the end; that the earning and the payment are antagonistic, not identical, the latter wiping off what the former has added on; and that simple interest is an impossibility or (in small affairs) a negligible inaccuracy, some absurdities will disappear. One such absurdity is in quarterly interest tables, where a part of the values appear to be worth *less* insted of more when the frequency of coupons is increast from semi-annual to quarterly. Another is the conflict in the price of bonds sold during the last period before maturity, where the seller invariably claims, and usually gets, more than is equitable and the buyer believs that he should have paid even less than the true figures which is somewhere between the two.

When the true nature of interest is recognized, our interest tables will be reconstructed for purposes of minute calculation so that the amount of $1 for three months at 6 per cent. per annum payable semi-annually will be stated at its true value, 1.01488915 6+, not roughly, 1.015.

The Advantages of Mathematical Training to an Accountant.

By Leroy L. Perrine, Ph.B., B.C.S.

In the casual course of conversation, one frequently hears the opinion that person with a mathematical training should succeed better at accounting than one who did not have such training, other things being equal. It is the general impression in accounting circles that, if a man is good at "figures" and is able to unravel the tangled skeins of algebraical or geometrical problems, it is inevitable that he will be equally adept at unraveling other tangled skeins found in the various lines of accounting. It appears, therefore, that it would not be inopportune to analyze the reasons which underlie this general impression and to determine what intellectual habits or qualities are inculcated by mathematical training which are of great value to an accountant, or in other words, to set forth those mental attributes which are common to both able mathematicians and able accountants.

Before proceeding further, it might be well to define what is meant by at least one of the words in the caption of the article, for since the days of Aristotle, it has been axiomatic that no logical discussion can be had without a clear conception of the subject discussed. Now, as to the meaning of the various words in the heading, there will be comparatively no diversity of opinion among average readers except relative to two, "mathematical" and "accountant"; and for the readers of this journal it would appear safe to eliminate the latter word. What meaning, then, is conveyed by the term "mathematical"? In the country or village school, that boy is regarded as good at "mathematics," whose hand is the first to go up when his teacher gives out some question in mental arithmetic; who can tell you in a second, by his short cuts, the answer to "$11\frac{1}{2} \times 11\frac{1}{2} = ?$" or "$29 \times 99 = ?$"; or who, when asked "if an article is sold for $1.62 at a profit of $12\frac{1}{2}\%$, what is the cost?" can give the answer before you have scarcely finished the question. In passing from the common school to the high school, arithmetic is left behind and the domains of algebra, geometry and trigonometry are entered. Here those boys are regarded as good "mathematicians" who get 95's and 100's on examinations dealing with the binomial theorem, with

imaginary quantities, with logarithms, or with geometric series; for whom the *"pons asinorum"* has no difficulties, and who feel at home in dealing with sines and cosines. In the college or university, scope for mathematical training is given in advanced studies such as analytical geometry, differential and integral calculus, and many other subjects. It appears, therefore, that the term "mathematical" is susceptible of several different interpretations, viewed from the standpoints of the common school, of the high school, and of the college or university. For the purpose of this article, however, a mathematical training is regarded as that which arises through the study of courses in arithmetic, algebra, geometry and trigonometry, which courses, it is assumed, will have been of sufficient length and thoroughness to insure the acquisition to a considerable degree of those mental qualities hereafter mentioned.

Among the intellectual attainments which it is desirable for every accountant to have, three of the most important are accuracy, power of concentration, and ability to reason clearly and logically. These qualities are especially acquired through the study of mathematics, more so, probably, than through any other study.

Genius has been defined as "an infinite capacity for taking pains," which definition might be construed as "an infinite capacity for being accurate." Perhaps Davy Crockett unconsciously had a similar idea in mind when he adopted as his motto, "Be sure you're right, then go ahead." Now, mathematical training does not aim at the production of geniuses, at least directly, but indirectly it tends to do this through the strong, insistent emphasis which it lays on the need of accuracy. It does this constantly from the simplest operations in arithmetic to the most difficult problems in the higher branches. There is a constant drill in exactness in adding and subtracting, in placing the decimal point, in transforming common fractions to decimals, in extracting roots, in changing the signs when transposing terms in algebra, and in hundreds of other cases which might be given. It is this incessant drill which makes the study of mathematics such an indispensable aid in the acquisition of accuracy, a quality which is a *"sine qua non"* to an accountant. For if we do not find accuracy among members of the accounting profession, where, then, shall we find it? To hold the continued respect and confidence of the business

world, accountants must insist on accuracy in all of their work, both mathematical and otherwise, and by probably no other study is this desirable habit so firmly impressed upon the mind as by the study of mathematics.

A second quality invaluable to an accountant is the power of concentration. The study of mathematics is especially valuable in helping to form this mental habit. A conspicuous example of this fact is found in the life of Archimedes, the greatest mathematician of ancient times. During the general massacre which followed the capture of Syracuse, he was intently engaged upon the solution of a mathematical problem and met his death at the hands of a Roman soldier while absorbed in drawing a geometrical figure on the sand. A modern instance is found in the story of the German professor of mathematics who, while out walking, suddenly thought of a solution to a problem. Observing a buggy near at hand with its top down, he thought it must be a blackboard and, reaching in his pocket for the omnipresent chalk, he commenced writing out the solution, keeping at it even after the horse started away. Many other examples could be cited to show the power of concentration to which the mind can become accustomed through mathematical training. One of the admittedly best accountants in the United States has this faculty to a marked degree and when deeply engaged in his work becomes oblivious to the clicking of typewriters, to the conversation of those about him, or to the thousand and one other things which tend to divert attention.

The third quality which is developed by mathematical training is the power of reasoning in a clear and logical manner, and of carrying a chain of thought from a foundation of facts to an ultimate conclusion based upon those facts. Perhaps the best example of this power is found in the discovery of the planet Neptune in 1846. Astronomers had observed for some years that the planet Uranus failed to move precisely in the path which the computers predicted for it. Using all the available data, the French astronomer Leverrier, by mathematical reasoning, came to the conclusion that there must be an unknown planet, and he so informed Galle, the astronomer at the Berlin Observatory. When the latter directed his telescope to the point indicated by Leverrier, a new planet was discovered in exact accordance with his conclusion. Careful reasoning is especially taught in the study of

geometry, where there is a hypothesis of certain facts, to which are applied certain axioms and theorems already demonstrated, the whole forming a clear, concise and logical argument leading to an inevitable conclusion. Accounting practice is full of problems similar to these met with in mathematics and it is necessary for the accountant as well as for the mathematician, to have an intellect like that described in one of Huxley's essays, "a clear, cold, logic engine, with all its parts of equal strength, and in smooth working order; ready, like a steam engine to be turned to any kind of work, and spin the gossamers as well as forge the anchors of the mind."

In addition to the general advantages of mathematical study to an accountant which have already been discussed and which refer only to a broad, general training, possibly attainable through studies other than mathematics, there are certain specific advantages which can not be gained through other studies. Among these are facility and rapidity in adding, in multiplying, in computing percentages, and in performing the various other more or less mechanical arithmetical operations which are necessary in almost every undertaking in accounting. Furthermore, various problems appear in the practice of accounting firms which depend for their solution upon an application of the principles of algebra and other branches of mathematics, and which cannot be solved by one who is not well grounded in these principles. Especially is this true with regard to actuarial branches of insurance work, where mathematical ability of a high order is demanded.

In order to illustrate the part which technical knowledge of mathematics occasionally plays in accounting, a solution is here given of a practical problem, similar to one which came up in actual practice a few months ago in a large accounting firm. It is possible that this problem may be solved by means of arithmetic, without the aid of algebra. The writer will not go so far as to say that there is no arithmetical solution, but if there is one he does not know of it. At any rate, it is believed that any arithmetical solution would be much more lengthy than the algebraical solution here shown. In the problem which occurred in actual practice and upon which this one is based, the period was 100 years instead of 10. This increase in the length of the period would doubtless correspondingly lengthen the work in any arithmetical solution, but it would not so affect the algebraical solution,

for the latter involves no more calculations for a period of 100 years than it does for one of 10 years. The period in the problem here given has been purposely fixed at the short term of 10 years in order that a proof might be given, a process which would be too long if the period were 100 years.

PROBLEM.

On January 1, 1911, William Smith will enter upon a contract whereby he will receive $100,000 net income semi-annually above all expenses of whatever nature for 10 years thereafter, up to and including December 31, 1920, the income being receivable on June 30 and December 31 of each year.

The Jones Manufacturing Company contemplates the purchase of Smith's equity in this contract. It is evident that whatever value this equity may have on January 1, 1911, it will be worth nothing on December 31, 1920, as the contract will expire on that date. Consequently the Jones Manufacturing Company must set aside a sinking fund to provide for the depreciation of the asset acquired. The company proposes to pay 6% annual dividends on the amount of its investment in the equity referred to, payable semi-annually on June 30 and December 31. These dividends are to be paid out of the $100,000 income to be received semi-annually, and the balance is to be set aside as a sinking fund and invested at 3% interest, compounded semi-annually, in order that the accumulation of this sinking fund at December 31, 1920, may equal the amount of the orginal investment. The problem is to determine the amounts of the semi-annual sinking fund and of the original investment.

SOLUTION.

Let x = Semi-annual Sinking Fund.

Let y = Original Investment.

There will be 20 sinking fund payments, and the sum of these together with the accumulated interest must equal the amount of the original investment.

The sinking fund payment made on December 31, 1920, will on that date equal itself, or x.

The payment made on June 30, 1920, will, on December 31, 1920, have increased by compound interest during one semi-annual period to $1.015x$.

The payment made on December 31, 1919, will, on December 31, 1920, have increased by compound interest during two semi-annual periods to $(1.015)^2 x$.

Similarly, the other sinking fund payments will increase. The first payment, made on June 30, 1911, will have 19 semi-annual interest periods to run, and will, on December 31, 1920, have increased to $(1.015)^{19} x$.

Now the sum of all of these payments, together with the interest thereon to December 31, 1920, must, according to the conditions of the problem, equal the original investment, or y. Hence, the following equation results:

$$(1) \quad x + 1.015\,x + (1.015)^2\,x + \ldots\ldots + (1.015)^{18}\,x + (1.015)^{19}\,x = y.$$

A second equation results from the fact that the semi-annual dividend, which is 3% of the original investment, or 3%. y, together with the sinking fund payment, or x, must together make up the semi-annual income ($100,000). This equation may be expressed as follows:

$$(2) \quad 3\%\ y + x = \$100{,}000.$$

We have now two equations of the first degree involving x and y, from which the values of each may be found.

By factoring (1), we get,

$$(3) \quad x\,[1 + 1.015 + (1.015)^2 + \ldots\ldots + (1.015)^{18} + (1.015)^{19}] = y.$$

The expression multiplied by x is a geometric progression and its sum can be found by a formula derived as follows:

Let a be the first term, r the common ratio, n the number of terms, and S the sum required, of a geometric progression. Then

$$S = a + ar + ar^2 + \ldots + ar^{n-2} + ar^{n-1};$$

multiplying every term by r, we have

$$Sr = ar + ar^2 + ar^3 + \ldots + ar^{n-1} + ar^n$$

Hence, by subtraction,

$$Sr - s = ar^n - a$$

Therefore,

$$S\,(r-1) = a\,(r^n-1)$$

or,

$$S = \frac{a(r_n-1)}{r-1},$$

which is the formula desired.

This formula we wish to apply to the bracketed expression in equation (3), in order to determine the value of the coefficient of x. In this expression $a = 1$, $r = 1.015$, and $n = 20$. Using these values, we have

$$(4) 1 + 1.015 + (1.015)^2 + \ldots\ldots + (1.015)^{18} + (1.015)^{19} = \frac{1[(1.015)^{20} - 1]}{1.015 - 1}$$

It is necessary next to find the value of $(1.015)^{20}$. This may be done by logarithms.

(5) log. $(1.015)^{20} = 20$ log. 1.015.

From logarithmic tables, we have

(6) log. $1.015 = .00646604$, whence

(7) log. $(1.015)^{20} = 20\ (.00646604)$, or

(8) log. $(1.015)^{20} = .1293208$.

Again using logarithms, we find

(9) $.1293208 =$ log. 1.3468548, whence

(10) log. $(1.015)^{20} =$ log. 1.3468548, or

(11) $(1.015)^{20} = 1.3468548$.

We have now found the value of $(1.015)^{20}$, and we may substitute this value in equation (4). Doing so, we obtain

$$(12) 1 + 1.015 + (1.015)^2 + \ldots\ldots + (1.015)^{18} + (1.015)^{19} = \frac{1[(1.015)^{20} - 1]}{1.015 - 1}$$

$$= \frac{1.3468548 - 1}{.015}$$

$$= \frac{.3468548}{.015}$$

$$= 23.12365.$$

It appears, therefore, that the bracketed expression in equation (3), which is the coefficient of x, is equal to 23.12365. Equation (3) then becomes,

(13) $23.12365\ x = y$, whence

(14) $3\%y = 3\%.\ (23.12365x)$, or

(15) $3\%y = .69371x$.

From equation (2), we derive

(16) $3\%y = 100{,}000 - x$.

By eliminating $3\%y$ from (15) and (16) we get

(17) $.69371x = 100{,}000 - x$, or

(18) $1.69371x = 100{,}000$, whence

(19) $x = \$59{,}041.98$, Semi-annual Sinking Fund.
Substituting this value of x in equation (16), we get
(20) $3\%y = \$40{,}958.02$, or
(21) $y = \$1{,}365{,}267.33$, Original Investment.

PROOF.

Original Investment	$1,365,267.33
Semi-annual dividend at 3%	40,958.02
Semi-annual Sinking Fund	59,041.98
Semi-annual Net Income	$100,000.00

Date of Sinking Fund Payment	Amount of Sinking Fund Payment	Interest Accumulated during preceding six months.	Total Accumulation of Sinking Fund, including Payments and Interest thereon
June 30, 1911	$59,041.99		$59,041.99
Dec. 31, 1911	59,041.99	$885.63	118,969.61
June 30, 1912	59,041.99	1,784.54	179,796.14
Dec. 31, 1912	59,041.99	2,696.94	241,535.07
June 30, 1913	59,041.99	3,623.03	304,200.09
Dec. 31, 1913	59,041.99	4,563.00	367,805.08
June 30, 1914	59,041.99	5,517.08	432,364.15
Dec. 31, 1914	59,041.99	6,485.46	497,891.60
June 30, 1915	59,041.99	7,468.37	564,401.96
Dec. 31, 1915	59,041.99	8,466.03	631,909.98
June 30, 1916	59,041.99	9,478.65	700,430.62
Dec. 31, 1916	59,041.99	10,506.46	769,979.07
June 30, 1917	59,041.99	11,549.69	840,570.75
Dec. 31, 1917	59,041.99	12,608.56	912,221.30
June 30, 1918	59,041.99	13,683.32	984,946.61
Dec. 31, 1918	59,041.99	14,774.20	1,058,762.80
June 30. 1919	59,041.99	15,881.44	1,133,686.23
Dec. 31, 1919	59,041.99	17,005.29	1,209,733.51
June 30, 1920	59,041.99	18,146.00	1,286,921.50
Dec. 31, 1920	59,041.99	19,303.82	*1,365,267.31
Total	$1,180,839.80	$184,427.51	*$1,365,267.31

* A discrepancy of cents as compared with the amount of the Original Investmen ($1,365,267.33), caused by not carrying the decimal places sufficiently far.

Depreciation and Reserve Accounts.

By H. D. Grant.

Proper reduction of an asset by depreciation is one of the most perplexing questions in the estimate of value which confront the accountant at various times. The principles of this abatement differentiate to conform to the conditions governing the asset which it affects. A plant, for instance, consists of the fixtures and tools necessary to conduct a mechanical business, and from the time of the first turning of a wheel of the equipment installed, its value begins to diminish as an asset. Outlay for betterments usually represents an increase in value, while repairs are an expense to keep up the original efficiency of the machinery. Buildings should be considered from the viewpoint of the wear and tear they can withstand. A stone or brick building is more serviceable than a frame one, and as its life is accordingly of longer duration, the charges for depreciation should be spread over a period that would terminate at its obsolescence.

The disposition of the fund for the purpose of replacement can be considered from two viewpoints in its effect. Costs for the re-installation of a new plant, in excess of the fund reserved, incurred with a view to improving the equipment, in order to facilitate production and to turn out a more perfect and salable article, should be incorporated as an increase in the value of the asset; whereas if the reserve fund proved more than adequate to replace, because of a decrease in the cost of equipment or of advantages of new inventions, any excess of the expenditure incurred should revert to surplus.

There are innumerable assets which are subject to this treatment of reserve, but in order to make clear the theory to be applied in writing down a revenue producing power, we shall compare the machinery of a manufacturing company with the rolling stock of a public utilities corporation, such as a street railway, The consumption of the former is a part of the cost of production, and asserts itself in the goods; while the latter represents the gradual decay of a utility until it is finally useless for earning power, and during its life, income is curtailed for an amount each fiscal period to be held against the asset as a reserve to replace the equipment.

The different opinions which have been set forth as to the proper amount of depreciation to be assigned to the reserve each period, have so far failed to establish a standard by which this reduced value should be treated. Accordingly one must decide on the relative merits of three plans; namely, the installment, annuity, and sinking fund methods. The last method consists in laying aside an equal amount each period as a charge to revenue, which is to be reinvested. No allowance is made for the gradual decreasing powers of resistance to which a plant is subjected by the ravages of power and time. On the other hand, the withdrawal from the working capital of the cash installments to the fund is in a measure compensated for by the compound interest earned by the investment.

As to the advisability of the annuity method in computing these values, I can only say that to me it seems wrong theoretically because it represents an increasing ratio of charge.

The installment method seems reasonably good if the periodical charge to revenue is made at a ratio that will eventually equal the original value of the asset to be replaced. A decreasing series of charges, governed by geometrical progression, would make this possible. For example, in the case of a plant, originally valued at $55,000, a fund to equal the asset can be accumulated by writing off installments each period at the ratio of $1,000 for ten terms, viz., $10,000, first year; $9,000, second year; $8,000, third year; and so on down to the tenth year or the first term, $1,000.

As before stated, any residue derived from the sale of the old plant should be credited to surplus. All interest from the investment of the fund is also a source of revenue, and partly reimburses the earlier charges to revenue account.

All plants in their early period of life require less outlay for repairs to maintain their efficiency than in their final stages. The last named method of treating the charge to revenue in creating a reserve, therefore, provides an equitable distribution to meet the additional later expenses.

As to the propriety of writing down the asset by setting up a reserve of charges against revenue in prior periods which would absolutely offset it, and thus leave no residual or scrap value on the balance sheet, the question arises whether or not said asset is to continue in the business as a working force for an indefinite period, or is to be immediately replaced. If it is to be retained,

the lesser efficiency of the asset in the work of production, as compared with the greater powers of new and up-to-date machinery, would be compensated for by not having to make a charge against it for depreciation, the only expense being for repairs and renew- also to keep it as nearly as possible in its original efficiency; whereas if the reserve were used to install new machinery, the charge for depreciation would equal the gain of revenue which would result from the improved working power.

Some of the accounting articles on this subject suggest the equalization of repairs as against the ratio of annual depreciation; that is, to combine the two, making an even cost of the asset consumed in production each year, but this is beyond the limit of sound judgment, for while it may be possible from experience to approximate the life of a machine, it is out of the question to set a yearly cost of repairs ten or twenty years in advance.

The Public Service Commission have taken the right view regarding the treatment of this class of assets. They advise an annual charge, governed by a knowledge of conditions, but advise against following a set rule.

There are a number of conditions to be considered in replacing a plant. As a typical case we will suppose that a company has an option on a piece of land adjoining its present site. It can construct a factory on the new property, therefore, without suspending operation. If, however, it had to replace the plant on the land at present occupied by the old factory, it would be compelled to stop work during the time consumed in erecting the new plant. Would it be more profitable to replace the old factory and suspend operations, or to construct a new factory on the adjacent property, operating the present plant at the same time? I think that the latter plan is preferable; but this is true of a manufacturing business only. A railroad company's rolling stock, on the other hand, is the direct purchase of a utility by which operations are not affected during replacement.

The proper way to treat this account on the general books would be to open a Depreciation Account on the ledger and credit it with the reduction each year and charge Profit and Loss; then withdraw cash equivalent to the annual credit and deposit or invest it and charge Depreciation Fund.

At the termination of the life of the asset the fund will equal the negative to the asset, Depreciation Account. By debiting

Cash and crediting the Depreciation Fund and by crediting Cash and debiting Depreciation Account, the respective accounts are extinguished and the old asset is converted into a new asset without further book entry. The residual value of the old asset represents surplus.

The original value is never eliminated from the books, but is offset by the Depreciation Account, its negative. The only time the asset can represent its present value after a lapse of time is by the deduction of the negative on the Balance Sheet, as follows, the course of depreciation being numerically arranged:

Loss and Gain

Machinery Account.

Cost		100,000			

Machinery "Residual" Account.

13					16
Surplus		10,000	10,000		Cash

Loss and Gain

2					11
Depreciation Acct.		100,000	100,000		Surplus

Production

					10
Manufacturing Goods		100,000	100,000		Cash

Depreciation Account

8				1	4
Cash	100,000	100,000		Loss and Gain	Cash

Cash

					3
Bal. begin		200,000	100,000		Dep. Fund
5					7
Dep. Fund		100,000	100,000		Dep. Acct.
9					
Production		100,000	200,000		Bal. ending
		400,000	400,000		
Balance		200,000			
15					
Mchy. Res. a/c		10,000			

Depreciation Fund

4					6
Cash		100,000	100,000		Cash

Surplus Account.

12			14
Loss and Gain	100,000	10,000	Mach'y Res. a/c

Reserve Accounts are treated in a number of different ways:

I. By charging revenue from operations and creating a reserve liability account, which leaves the value distributed among the assets.

II. By charging revenue and crediting the asset for which the reduction was made, thereby representing it on the Balance Sheet at its present estimated value.

III. By the same treatment, with the exception that a fund be incorporated for the amount of the reduction and set aside out of assets.

IV. The last, and what I think is the most practicable and safe way, is to charge revenue, and to create a reserve account which will stand as a negative to the asset reduced; then in turn establish a fund by the withdrawal of an asset equivalent to the amount of the reduction, invest it, and credit all income from such investment to revenue. By this process, money to replace the plant is assured at the termination of the life of the asset, while at the same time revenue is being earned on the money so withdrawn to make up the fund.

Some people contend that it is better to keep the cash employed in the business as working capital than to assign it to a fund, thinking it better to convert the revenue to the extent of the asset when the time for replacement is at hand. This, however, is purely a question of the difference of the return that money would bring as a loan as against the income to be derived from the investment of funds. If a fund is not established there may be an excess of cash working capital, and an asset of that nature unemployed is not as good as the same asset invested and accumulating interest as a fund. If a company is in a prosperous condition and its earnings are adequate to provide for the reduction of an asset, which is being used up in the work of production, there is no tangible reason why the amount of a liability, which a reserve account represents, should not be set aside and invested as a fund. When such a resource is on the Balance Sheet, it states the conditions as they should actually be and the purpose for which the liability was created. On the other hand if a fund is

not established it is taken for granted that at some future time the full extent of the reserve account will be able to be realized without sacrifice, and while this may be the custom and the proper course to pursue in handling this class of assets, it is not consistent with good accounting; and the sooner the balance sheet shows the true status of the account, conditions will be bettered to that extent.

Reserves in all forms are incorporated to take care of contingent and foreseen losses or the depreciation of some fixed asset; and in view of that fact, the affected asset should appear on the balanced sheet at its true value. If the reserve is excluded from the Balance Sheet as a liability record, and applied against the asset for the reduction of which it was created, and if no fund has been established, what does the Balance Sheet show? Obviously that a loss has been sustained with no apparent record of such ever having been the case.

Depreciation is an indirect portion of the cost of production, and is an expenditure in a class with other manufacturing outlay. That outlay was included in the original value of the plant, but was consumed in the work of production during subsequent periods. When cash is credited with the amount of the withdrawal to be invested as a fund for replacement, the depletion of the value of the asset by depreciation is a deferred expenditure.

Reserve for bad debts or discount is in an altogether different class from reserve for depreciation. Such reserve has no immediate bearing on the value of an asset, but is only created as a safeguard to true realization, and any excess over actual loss reverts to surplus.

The application of depreciation to an investment fund should not be misconstrued with a sinking fund. They are distinctive in that the revenue derived from the former is treated as a direct cash receipt of the business and a credit to Profit and Loss, the fund never showing any increase above the amount set aside for reserve each period, while the latter represents each periodical installment plus its interest from investment.

There seems to be no limit to the theoretical opinions in regard to this branch of accounting work, but it is a most important and difficult branch of such work, and I trust that this article, while it deals only with part of the question, will, in a measure, be instrumental in making clear some of its intricacies.

The Economics of Railroad Maintenance of Way.

By W. M. Cunningham.

Inasmuch as the investment in our American railroads is immense, and freight and passenger rates are prescribed by law, a sudden and tremendous fall in traffic really seems at first glance to render necessary and inevitable a drastic reduction in operating expenses, including of course maintenance of way, and the prudent management that has spent liberally in good times so that among other things it has the advantage of being able to retrench in bad times seems to be worthy of full commendation. This seems especially true when we consider in any given road how small a falling off in gross earnings, if unaccompanied by a more or less corresponding falling off in operating expenses and maintenance would so limit the net earnings as to render dividend payment or even bond interest impossible. But it is necessary to make some study of the economics of Railroad Maintenance of Way, before giving unqualified endorsement to this policy.

In studying maintenance in this broad way we find secondary sources of little value. The economics of railroad location both from the broad economic and from the strictly engineering standpoints have been worked out thoroughly by such classic authorities as Wellington, as have many of the problems of operation, but the only things found supposedly bearing at all directly on our subject are two meagre volumes. The first is the "Elements of Railway Economics," by William M. Ackworth, the alleged English authority. The second is called "Railway Economics or Notes With Comments From a Tour Over Ohio Railways, Under the Hon. H. Sabine, Commissioner of Railroads and Telegraphs," 1882, by S. W. Robinson, professor of engineering at Ohio State University. Books like Camp on "Track," and the *New Roadmaster's Assistant* give a good account of how to conduct the actual work of maintenance; and scattered here and there among pictures of tie plates, tamping bars and spike mauls there is some information about smaller points of economics such as the use of tie plates, and the lasting qualities of different kinds of ties, but there is no general treatment of railway economics. The greater portion of our material must be drawn from personal knowledge of maintenance practice. There is a lack of definite information

and statistics in regard to the details of maintenance expenses—a lack that could in part be obviated perhaps, if the railroad managements so desired, but which is in large part inherent in the nature of the subject. For example, a low joint may be traced to poor drainage, light rails, poor ballast, defective joint, poor ties, heavy engine, flat wheel, or other sources, and its repair may involve merely labor, or the replacement of various materials; such as rails, ties, plates, or the like. It may be merely ordinary maintenance or may be betterment.

Railroad maintenance includes the expense of natural deterioration, of extraordinary weather, of transportation contingencies and of betterments. The last named, betterments, belongs as logically to construction or cost of road as to maintenance. Indeed whether a certain piece of work, as for example, the betterment of alignment by the easing of a curve, should be charged to betterment maintenance to be provided for from operating expenses, or to new construction—to be provided for possibly from capital account—varies with the management of the road and its particular financial circumstances at the time. In a very general way we may state that the American roads follow the conservative method of classifying improvements on the same right of way as maintenance, while the English roads are more inclined to charge betterment features to capital account. (Result, lessening per mile capitalization of American roads—constantly increasing of English.) A great part of the maintenance, especially under progressive management, has an element of betterment in it that can easily be seen but can scarcely be separated. For example, if new ties are put in of better quality—heavier or closer together than the ones they replace—just to the indefinite extent that the road is thereby improved it is in the ordinary sense of the words not merely maintained but bettered; and yet we could, except under very exceptional circumstances, unhesitatingly condemn the charging of such betterment to capital or even to construction account. Where heavier rails are laid, the excess of weight over the original weight of the rails replaced is clearly betterment and has at times been charged to capital account; yet even here the improvement in quality of material is actually a betterment, even though the cost in proportion to weight may be less. I lay particular stress upon this betterment element in maintenance, for however indefinite this element may be and however merged with

the remainder of the maintenance account, I regard it as fundamental in this discussion and wish it to be borne constantly in mind.

In order to bring out the elementary features of this discussion I shall give a brief outline of railway maintenance together with tables showing the relative cost of the different elements, and I shall go into a number of different maintenance items to bring them to mind somewhat more clearly. Naturally of the vast field of these, I shall try to choose the more important ones, and the ones that are most interesting from the standpoint of our discussion, trying to bring out different maintenance aspects of them, and to that end making varied comments upon them. I should state here, however, that in dealing with this confused mass of items the economics of one sort and another are so related and contradictory that by the use of this inductive method the ultimate economy does not at once appear. Our line of reasoning runs at first largely along the lines of current and accepted practice. When we understand this and its economy we are prepared to generalize for ourselves, and not until then. This rather cautious method furthermore rather suits me in trying to study a branch of railroad work of which I know nothing, for in some other lines of railroad work in which I have had a little experience I know something of the dangers that beset the theorist.

The Economics of Maintenance are divided into two heads:

1. Maintenance of Way and Structures.
2. Maintenance of Equipment.

Maintenance of Way and Structures is usually divided into three heads:

1. Repairs of roadway.
2. Renewals of rails and ties.
3. Repairs and renewals of bridges, culverts, fences, crossings, signs, cattleguards, stations, buildings, decks, wharves and telegraph equipment.

Of these three headings we are concerned directly with the first two or Maintenance of Way, comprising about 70 per cent. of the total.

Under our first head, Repairs of roadway, we have

(a) Rail fixtures, such as frogs, switches, switch stands, interlocking plants, signals of all kinds, etc.

(b) Labor of distributing and laying rails and ties.

The maintenance is against natural deterioration, weather, snow, weeds, fire, and damage by wreck and lawlessness. It is made to include also betterment by ballasting, widening, and protecting slopes; scaling cuts; ditching; lining tunnels; filling trestles; rip-rapping; etc.

Costs incidental to the maintenance and betterment of roadway are also included, as outlay for snow fences, dykes, retaining walls, piling, quarry, borrow pit or gravel pit rights (where the land is not held in fee) or other concessions in connection with roadway maintenance, and the cost and maintenance of ordinary tools and necessary material and supplies, as well as current costs for labor and supplies of ditchers, work trains, steam shovels, pile drivers, snow plows, etc. (The first cost of ditchers, work trains, steam shovels, etc., is usually charged to equipment, and their maintenance to maintenance of equipment.)

Maintenance of track is construed to include surfacing and lining, patrolling track, clearing weeds, fighting fires, and sprinkling oil to lay the dust, on the right-of-way and adjacent property, as these are incidental costs in maintaining the track in normal operating condition.

Surfacing of roadbed, mowing and cleaning of the right of way, cleaning ditches, and maintaining fences, road crossings, signs, and cattle guards, as a rule remain more stable than most of the other charges. The manifest economy lies in attending to them at the proper time (i. e., in most cases when the need manifests itself, and in case of weeds at the proper seasons). Surfacing, lining, gauging, putting in new ties, raising low joints, etc., should be done as soon as frost is out of the ground—before heavy traffic of summer, and before harvest takes away extra men. It is not economy to allow the track to get in bad shape in the summer, as the same work cannot be done to advantage in winter. Cleaning of ditches depends upon miles of right of way, not upon miles of track or traffic. Lack of expenditure in this direction may result in very large increased expenses in restoring track surface on account of the yielding of the roadbed when wet and soft. Surfacing is the only one of the above items affected directly by tonnage. Surfacing is the adjustment of level and line which becomes necessary because of inequalities caused by ballast compression. Such inequalities are due to the elements and to shocks and impacts from rolling stock, especially from the locomotive on account

of the magnitude of the wheel loads and the driving or reciprocating impulse.

The best ballast is that which will best form a durable support to the ties, retain its solidity and position under the disturbing effects of weather and traffic, give good drainage, be free from dust, and make an easy riding track. Broken stone is in general the best material for ballast, as it meets all the requirements noted and can be worked in wet or dry, cold or hot weather alike. Oiling ballast provides for the comfort of passengers, reduces the chances of hot boxes, kills or tends to check the growth of weeds and reduces the heaving action of frost.

As a road becomes older, especially with proper maintenance, the natural conditions become less and less a factor in determining expense, while the standard of the road, as determined by the management and by the service required, becomes the main factor. Light track with poor drainage and heavy power makes large expenditures for surfacing necessary. Strong track well drained with light power shows the converse effect.

In the absence of extraordinary weather or faulty management the roadway accounts should run high, and especially if such items as ballasting and lining tunnels, widening slopes, and filling trestles should run heavy it would indicate that the road had been bettered and in time should be reflected in a falling off in surfacing, lining, and adjustment (also in bridge work). Such betterment charges may manifestly be cut down in large part during depression without lessening operating efficiency, as such scaling down would represent merely a failure to continue betterment or raising of standards.

It is recognized that tie plates not only increase the life of ties, but also effect a direct economy in renewals and maintenance of way, while at the same time they add to the permanence and security of the track by giving a durable and uniform bearing to the rails and lessening the disturbance of track for tie renewals. They are especially advantageous for soft ties under heavy traffic. They tend to prevent the widening of the gauge which occurs, particularly on curves, and more particularly on sharp curves (unspiralized ones), or when the proper outer rail elevation is lacking. This widening occurs by the tilting of the rails as the lateral pressure causes the outer edge of the rail base to cut into the wood. They also cause the spikes on both sides of the rail to act almost

equally to resist the lateral pressure, for the tie plate ties the two spikes together, and is thus equivalent almost to double spiking.

Renewals of Rails and Ties.

1. Renewals of Rails.

This covers the cost of rails used in maintenance, including first cost of transportation and inspection, but not the cost of their distribution or of any labor in placing them. It does not include rail fixtures, such as angle plates, bolts, frogs, switches, tie plates, etc.

The rate of wear must be explained by the weight and speed of trains and condition of rolling stock, as well as by the ton-mileage. It will also be largely affected by the standard of ties, ballasting and surfacing, the alignment and gradients, and extent and sort of curves, especially their degree, and whether spiralized or not. The rate is greater as the rail becomes more worn on curves.

The relaying with heavier rails should be noted as betterment maintenance. This is a constant need, owing to the increasing weight of the equipment, the effect of which falls more upon the rail than upon the tie maintenance as with the decreasing cost and increasing quality of the rails and the increasing cost and decreasing quality of ties the desired increase in stability and strength can be more economically secured through increasing the rail weight than by improving the tie support. If we assume that all weights of rails have similar cross-section, then since for beams of similar cross-sections the strength varies as the cube of the homologous dimensions, and the stiffness as the fourth power, while the area (and therefore the weight per mile of length), only varies as the square, it follows that stiffness varies as the square of the weight, and strength as the 3/2 power of the weight. 10% of weight (and cost) adds 21% to stiffness and 15% to the strength.

The rate of renewal is the main factor of importance, and while wear is reduced with the reduction of business, there is no doubt that on this item the roads have been reducing maintenance disproportionately, much of the reduction on the best roads, however, corresponding to the "betterment" reductions in Repairs of roadway.

The requirements for maintenance of trackage not a part of the main line vary on any road. Some is scarcely inferior to the main line while for some which is merely for car storage, old curve rails or the refuse of scrap piles is economic usage.

RENEWAL OF TIES.

This account embraces the cost inspection and delivery of all ties, whether cross ties, bridge ties, or switch ties, and wherever laid. The maintenance is against wear, natural deterioration or the damage or loss by fire, freshet, or accident. No labor except that of inspection is included. As with rails, no proper transportation charge is defined. The life of a tie varies according to the kind of wood, climate, nature of ballast of roadbed, mode of dressing, kind of chemical treatment, if any, bearing surface demanded by rail, weight of rail, weight and speed of rolling stock, tonnage, use of tie plate, etc. After the ties have been through one or two periods of renewals the need of renewal will be tolerably even from year to year. Important reduction in this item cannot be made for a period of several years with ordinary ties on a fast traffic road without imperilling its safety. The ties for sidings, yards, spurs, etc., should often be culls or seconds, and if there is any variation on the main line the best ties should be on curves and bridges. Betterment by putting in better ties is not common, owing to the increasing cost as previously stated, though this increasing cost has become so great that the best engineering opinion now favors the use of metal or treated ties, the vulcanizing, creosoting, burnetizing (chloride of zinc process), or the Wellhouse (zinc-tannin process) methods being the favorites. Webb, a recognized authority among practical engineers, estimated the value of the treated and untreated ties, as obtained from the Atchison and Rock Island experiments, as follows:

	Untreated	Treated
Life	7 years	14 years
Original cost	.40	.65
Int. upon 1st cost at 4%	.016	.026
Sinking fund	.051	.036
No. annual cost	.067	.062

On this basis, treated ties cost .005 less per annum, besides the saving in the average annual cost of maintenance for the life of the tie, which includes the cost of laying and the considerable amount of subsequent tamping that must be done until the track

is fairly settled in the roadbed, besides the regular track work on the tie, which is practically constant. This is easy to see but difficult to compute, and besides there are the still more indefinite advantages resulting from the smoother running of trains, and less wear and tear on rolling stock due to less disturbance of the roadbed. This advantage of the treated tie has already been increased, as the original cost is now higher, and is a form of betterment maintenance that should and will be adopted in spite of the effect of increasing maintenance cost for the first few years; that is, unless the similar but greater advantages of the steel tie prevail, as they naturally will tend to do with the increasing cost of wood ties, especially if there is a lowering of steel prices for a long period. Even the most progressive roads are slow to follow engineering opinion in regard to treated or steel ties because of the large, though tmporary, increase in maintenance.

The introduction of high speeds has been perhaps the main factor in track improvement, since such conditions of traffic cause increased cutting of the ties, shifting of the ballast and general disturbance of the line and level of the track, thus increasing maintenance expenses to a marked extent temporarily; but where—as is the rule—substantial track construction is introduced as a result, the subsequent cost of maintenance is likely to decrease in spite of the higher speeds, the track being better able to withstand the strains to which it is subjected. Practical experience has conclusively shown the necessity of substantial and smooth track in securing the maximum effective work of the motive power equipment.

Even in this hurried sketch of a few features of maintenance of way, I trust that the general truth is clear that there is scarcely a single feature but is related to and affected by every other, directly or indirectly. Divide the roadway into its component parts for analysis as we may, it is itself a unit. (Suppose the case of poor ditching—the roadbed softens, causing more rapid tie decay and an almost immediate disturbance of line and level, affecting stress on rails and spikes and injuring equipment—which in turn perhaps injures track and the track other equipment, the whole thing running in a vicious circle.)

You see also the economy of maintenance in the ordinary sense of the word, i. e., keeping the track and roadbed in at least its usual condition. Any deterioration is in the long run not only

uneconomical to a marked extent, but a usurious borrowing from the future for the present.

The betterment maintenance, on the other hand, you see as a borrowing from the present for the future. The immediate result is an additional expenditure in the present for a much greater saving in the future. To quote a classic example, the Union Pacific was transformed largely by liberal maintenance charges from two streaks of rust over which rattle-trap equipment moved slowly and precariously, into the present magnificent road with heavy rails, good ties and ballast, and splendid equipment. And now the cumulative effect of the general betterment—of which betterment maintenance was a large part—is such that the maintenance charges can be, and as a matter of fact have been, reduced to almost unheard of figures without impairing efficiency.

Betterment maintenance, in other words, after its effects have time to show themselves, effects such saving that it can be continued without increasing maintenance charges above what they were previously. This is seen in ordinary times by the fact that maintenance charges are as a rule no higher on well maintained roads than on poorly maintained ones. And in addition, as we have seen, in case of necessity, either real or supposed, the maintenance charges may be freely cut without impairing efficiency, largely by the elimination of the "betterment maintenance." The poorly maintained roads, on the other hand, cannot retrench to the same extent, and what retrenchment they can accomplish as a rule is at the expense of efficiency and accepted economy.

Vast as is the improvement from the old-time standards exemplified today in many roads (as for example, on the Niles and New Lisbon, and until recently on the Clover Leaf, where the track heaved and moved noticeably under the movement of heavy trains), to track like the Pennsylvania, yet even the latter must be worked over continually and is in no sense stable except by comparison. The tendency is logically continually toward more and more "betterment maintenance," making ordinary maintenance lighter and lighter. The drift of this tendency toward heavier rails and better ties, the latter treated or of steel, good stone or gravel ballast, heavier bridges, or where possible replaced by fills, is plain, but the same tendency may and, I think, will ultimately take us away entirely from the present American system of carrying the rails and ties in loose ballast, and from the prevailing

European and Indian systems as well. In this connection reference may be had to the heavy steel rails laid directly upon concrete longitudinals or floors in street railway construction. The unsuccessful experiments with rails fastened direct to the solid floor of a cut are very often put forward as an argument to show the necessity of providing elasticity in the track. This idea has, however, long ago been exploded. The more rigid the track, the better and easier the trains will ride, provided that it is rigid as a whole, with no independent movement or play between its parts. If the old rails could have been attached absolutely rigidly to the rock the results would have been different, but with light rails and primitive fastenings the rail was loose and was battered between the wheels and the rock foundation. Ultimately it would seem that the track should be practically permanent; perhaps of heavy rails laid in concrete and connected by light steel ties to reinforce them and to maintain gauge.

So far we have been explaining, and in a way vindicating, the maintenance policy of the better managed and more progressive roads—especially the betterment maintenance policy. But here we should draw a distinction between the fact that their betterment maintenance policy, among its other good and economical features, helps them to reduce maintenance charges during depression largely by cutting betterment features—without reducing efficiency—and the apparently generally accepted idea that such reduction is in itself the truest economy. I state it in this particular way, i. e., "helping them reduce maintenance charges largely by cutting betterment features," because I can have no quarrel with one sort of reduction that the reports lay much stress upon, namely, the reduction of ordinary maintenance costs that comes because of reduced cost and increased efficiency of labor and lessened interference from train movement. But that is not a reduction in efficiency but in cost, and so is worthy of all praise. My one contention in this is that this same increased efficiency, lower wage rate, etc., makes the time of depression the ideal time for an increase of betterment maintenance rather than a decrease or elimination, as is now the accepted practice.

It is a notorious fact that during the height of boom times freight movement is more costly, largely by reason of the congestion, and we know also that a fair though varying percentage of all freight hauled is for the road itself. A reduction in better-

ment maintenance during the congested period preceding the panic would obviously tend to relieve the congestion and reduce the average transportation costs of the road. While the cost of transportation of maintenance freight is either not counted at all, or is given at an arbitrary sum governed usually by regular freight rates rather than by the actual cost to the road, this actual cost would obviously be greater than in uncongested periods.

The cost of material during the congested traffic period is naturally at its highest and delivery slowest, and after the depression is well under way the cost is at its lowest and delivery most prompt. As the efficiency of labor in proportion to its cost is if anything at its best during the first part of the panic, when new construction is almost at a standstill, that period would seem on the whole the best for extra expenditure on the betterment features of roadway, as these charges are almost wholly for labor. This would apply especially to work like filling trestles, widening trestles, or improving alignment, where the lowest grade of labor predominates and the work involves the minimum expenditure for material. This is, however, the period when the roads are apt to be most cramped for ready money, as during the present panic when they had spent so lavishly during the boom or prepanic. Later in the depression period, however (as for example at present), the better roads are in strong financial position, labor efficiency is still almost at its best, transportation cost of maintenance freight is still almost at its lowest, traffic interruption is still measurably lower than in boom periods, and the cost of maintenance materials, especially of structural steel and rails, is at rock bottom. Last of all, a great period of prosperity and enormous traffic is ahead, when the facilities of the railroads will be overtaxed, and when every improvement and betterment now made will yield then the greatest possible return.

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EDITORIAL

Does Business or the Law Need Reform?

February is a month in which the prophet of evil is listened to with attention if not with respect. At the present time he is declaring that the country has speeded too fast since 1907, that the weakness of the stock market since last September is an inevitable result of the antecedent excess of confidence, that the buying power of the people has been exhausted, that dull times are ahead. We take little stock in these gloomy predictions. Overhanging the industrial world at the present time there is only one cloud black enough to give the commercial mariner any cause for apprehension. It is the fear lest the courts by their interpretation of the Anti-Trust Act of 1890 shall deprive this country of the advantage it possesses on account of the low cost of production made possible by the large scale of its industrial operations.

In his Lincoln Day address in New York City President Taft gave expression to this remarkable sentence: "If the enforcement of the law is not consistent with the present methods of carrying on business, then it does not speak very well for the present methods of conducting business, and they must be changed to conform to the law." He was speaking of the so-called trusts and of the Anti-Trust Law or Sherman Act, and he apparently takes it for granted that the law is reasonable and just. If this

is really the attitude of the President toward the law, and if the policy of his administration toward business corporations is here correctly indicated, there is reason to fear that the dismal prophecies above referred to may be justified.

The average business man doubtless has very little knowledge of the Anti-Trust Law, and the American people still less. The newspapers of the country have reported with considerable satisfaction that the government has won its suits against the Tobacco and Standard Oil Trusts in the lower courts, and the public, hating monopoly in every form, has read the news with delight. It is probably known to very few persons outside the legal profession that both these decisions were based on technicalities, and that neither trust has been found guilty of the obnoxious practices usually thought of as monopolistic. In fact, the so-called crime of which the lower courts have declared these two trusts guilty, has undoubtedly been committed not only by the United States Steel Corporation, but by many hundred corporations throughout the country which are inconspicuously transacting a business that is universally regarded as perfectly legitimate.

The technical infraction of the law of which the Tobacco and Standard Oil Trusts have been found guilty consisted in the combination of corporations that were alleged to be competitors. Like the Northern Securities Company, they are mere holding companies for the stocks of other corporations, and the Supreme Court has already held that such a company, if it gets the control of two companies doing an interstate business, is illegal. In defense of the Standard Oil Company it was argued that the combination effected in 1899, when the present company was organized under the laws of New Jersey, did not work any restraint in trade for the reason that the consolidated companies were not and never had been competitors, the stocks of all having been for many years the property of the same men who acquired the shares of the Standard Oil Company of New Jersey. Everyone knows that this claim is true, and the Court did not question it, but held that the minor companies were potentially competitors and that the surrender of their potential independence to a big holding company was a violation of the law. It is common knowledge that the Standard Oil Company is no more and no less a monopoly now than it was before 1899, yet

the change made in its organization in that year was the only "crime" of which it now stands convicted. As changes of the same sort have been made by numerous other corporations since 1890, it is evident that they are liable to attack and to dissolution if the Supreme Court sustains the decision of the lower court.

It is a rather remarkable fact that the government was not able to convict the Standard Oil Company of any of the grosser offenses that were charged against it, and of which it is commonly believed to have been guilty. What the people dislike about a monopoly is its power to control prices by limitation of the supply, and to drive competitors out of business by the quotation of ruinous prices in localities where competition exists. These two practices are the earmarks of a monopoly and have for over a century been condemned by the common law, which is an expression of public sentiment with regard to what is right and just. The forestalling or cornering of a market for raw material is another monopolistic practice which the common law condemns. The American public is pretty strongly convinced that the Standard Oil Company has been a sinner in all these respects. Indeed, in the standard American texts on political economy this trust is usually referred to as being the chief sinner among capitalistic combinations. It is surprising, therefore, that the evidence adduced by the government was not sufficient to convince the lower court that the Standard Oil Company had been guilty of any of these practices which are recognized as criminal under the common law. So far as offenses of this sort are concerned this great trust has emerged from the lower court with a Scotch verdict. It has not been proved to be what Mr. Roosevelt called a "bad trust." Judicially it and the Tobacco trust are lined up with the "good trusts," so that if the Supreme Court finds against them, all the capitalistic combinations in the country, large and small, which are engaged in interstate business, must either dissolve or accept the hazard of litigation. That is the reason why the business world is awaiting with such great interest the decisions of the Supreme Court in these important cases, and it doubtless accounts in part for the reluctance of certain great industrial leaders to undertake enterprises calling for a large outlay of capital and the employment of many thousand workmen.

Under these circumstances it is hard to understand why President Taft should calmly assume that the Anti-Trust Act, a

law hastily framed to appease an angry and ignorant public sentiment, is a model either of justice or expediency. Mr. Taft, the jurist, is well qualified to express an opinion as to the meaning of the Act, but it is to be feared that his idea of the business needs of this country are narrow and academic. The people of the United States hate monopoly. They are resolved that the strong shall not exterminate the weak by cut-throat competition. They want laws which will make it impossible for any set of men to control or fix the prices of the necessaries and comforts of life. They want industry to be an open and fair field for all comers. They want the small man to have as good a chance in the world as the big man, but we do not believe that they will endure a law which threatens to undo all the good which the American genius for industrial and business organization has accomplished in the last thirty years. If the Sherman Act cannot kill monopoly except by virtue of a technicality that would destroy all large scale production, then it is the law, rather than business methods, that must be reformed.

The Periodical Publishers' Association is waging a vigorous and just campaign against the adminstration's proposal for an increase in the second-class rate of postage on periodicals other than daily newspapers. The Association denies that this service is the cause of the postal deficit and demands "that Congress shall provide for a competent cost expert to work in the Post Office Department, and that this expert shall be given full opportunity to get what the Department has never produced, the facts and figures which show just how much the second-class mail is costing the Government in excess of the revenue it produces".

The Education of Accountant Students.

It has been officially announced that, from and after June next, the Chartered Accountants of Scotland will cease to conduct a Preliminary Examination for apprentices, and that in future candidates for articles will be required to produce either a school-leaving certificate of the Scottish Education Department or some other certificate of equal value; or, failing that, to pass the Preliminary Examination for graduation in Arts at one of the Scottish Institutes on the subjects hitherto required for the Preliminary Examination of the Scottish Chartered Accountants. *London Accountant.*

Uniform Accounting Legislation.

Pursuant to an invitation received from the National Civic Federation, the following delegates were appointed to represent the American Association of Public Accountants at the Conference on Uniform Legislation which met in Washington, D. C. on January 17, 18 and 19, 1910: Charles N. Vollum, E. W. Sells, W. A. Chase, R. H. Montgomery, Edward L. Suffern, J. E. Sterrett. The conference was composed of delegates appointed by the Governors of forty-four States and from some eighty business, professional and civic organizations. Unfortunately, Mr. Vollum, Mr. Sells and Mr. Montgomery were prevented at the last moment from attending the Conference, but the delegates in attendance were reinforced by Mr. Harvey S. Chase, who had been appointed as one of the delegates representing the State of Massachusetts. Mr. Chase read an interesting paper upon Uniform Accounting for Municipalities, and introduced a resolution, unanimously adopted, endorsing legislation aiming to promote this object. Mr. Chase said in part:

Ten years ago no city in this country had a system of financial records—public accounts—which was based on broad, uniform, comparative lines; today every city throughout the country with 30,000 or more population and many smaller cities have the opportunity to adopt—and some hundreds of cities have already adopted—a sound, sensible standard system of classification which renders comparisons of costs of administration possible. Ten years ago, none! Today, hundreds of cities!

This is the story: In 1901 one city—Newton, in Massachusetts—took the lead and published a report laid out upon the "uniform" lines for city financial reports as recommended by the National Municipal League. The next year Baltimore followed, then Chicago came into line in part. Various Massachusetts cities followed. The State of Ohio passed a uniform accounting law and at once 70 cities adopted the Municipal League schedule so far as the statutes of that State permitted. This happened in 1902, in 1903 and 1904. Meanwhile New York State attempted a uniform law and was induced to lay out its classification on the same lines. Then came the Massachusetts act in 1906, after a four years' campaign of education. This act applies to all cities and to all towns in the commonwealth. Meanwhile, the permanent Bureau of the Census had been required by Congress to procure statistics from all cities in the country regularly. The division which had this matter in charge, under the able direction of Dr. L. G. Powers, has gone on from year to year enlarging, improving and standardizing the Municipal League's schedules until now they may be considered complete—uniform for all cities, in all States of the Union.

The delegates from the American Association presented the following resolution, which was adopted without dissent by the Conference and with other resolutions was transmitted to the Conference of Governors in session in Washington at the same time:

WHEREAS, some twenty-one States have enacted laws regulating the profession of public accountancy, all of which seek to attain the same ends but differ in important particulars as to standards and requirements, and

WHEREAS, the proper regulation of the profession of accountancy is a subject of rapidly growing importance to the business community, therefore be it

Resolved, that this conference heartily commends the prinicple of uniformity in certified public accountancy legislation, which should in every case require adequate standards as to education and training for admission and should provide suitable punishment for unprofessional conduct.

The Association was further represented upon the programme of the Conference by a paper, by Mr. Sterrett upon, "Legislation for the Control of Corporations," which was printed in the February issue of THE JOURNAL.

Our American View of Depreciation.

At the annual meeting of the American Association of Public Accountants, held at Denver, U. S. A., last October, a very interesting paper on "Depreciation, Renewal, and Replacement Accounts," was read by Mr. Herbert G. Stockwell, C.P.A., which we hope to reproduce in these columns at an early date. The New York JOURNAL OF ACCOUNTANCY of last month also contains an interesting article by Mr. H. W. Wilmot, C. P. A. (of Messrs. Price, Waterhouse & Co.), reviewing Mr. Stockwell's paper, and this, also, we hope to be able to place before our readers in due course. In the meanwhile, however, we think that attention may with advantage be directed to two matters which show that in some respects at least the American Courts are more businesslike in their attitude towards questions of accountancy than the Courts of this country.

The case of *George W. Hill v. Antigo Water Company*, which is referred to by Mr. Wilmot in his article already mentioned, is a case that came before the Railroad Commission of Wisconsin, raising a question as to the determination of the fair value of the company's properties for rate-making purposes. In the course of their decision the Commissioners stated that depreciation may be described as an amount that must regularly be set aside to cover wear and tear, etc., in order to keep the original investment intact. It is, they decided, an operating expense, and as such should be borne by the customers of the company through the rates paid by them for the water service; but, they added, when depreciation is so borne by the customers, it should be set aside by the company until needed for the renewal of worn-out or useless parts of the plant. If, instead of being so set aside and used, it is diverted to the stockholders for their use and personal benefit, such diversion is tantamount to the payment of dividends out of capital.

It is surprising how many distinct ideas are compressed into this comparatively short statement of the position. The fact that depreciation is an operating expense may, perhaps, be dismissed as a commonplace in connection with so much that is really novel; but the idea that a company's charges have been deliberately increased so as to throw the cost of this operating expense on its customers, and that accordingly a corresponding proportion of the gross revenue received should be regarded as money held in trust to be applied only to this particular purpose, is, so far as we are aware, as novel as it is to our mind entirely unassailable.—*London Accountant.*

Extracts from Report of the Secretary of the Ohio State Board of Accountancy.

The State Board of Examiners for the C. P. A. Degree in Ohio, which was appointed on May 22, 1908, in accordance with an act of the legislative creating a State Board of Accountancy for the regulation of the practice of the profession of public accountancy in Ohio, has recently rendered a report on the administration of the law, through its secretary, Mr. J. H. Kauffman, from which the following extracts are taken:

After careful consideration, the Board adopted the following definition of a public accountant:

A public accountant is a person skilled in the affairs of commerce and finance, and particularly in the accounts relating thereto, who places his service at the disposal of the community for remuneration and maintains an office for the transaction of such business; whose time, during the ordinary hours of business, is not entirely under the control of any one individual, firm or corporation.

This definition was submitted to a number of leading Certified Public Accountants and the question was carried to a convention of The National Association of C. P. A. Examiners, held at Atlantic City in October, 1908, at which the following definition was adopted:

A public accountant is a person skilled in the affairs of Commerce and Finance, and particularly in the Accounts relating thereto, who places his services at the disposal of the community for remuneration, but not entirely at the disposal of any one individual, firm or corporation; and who maintains an office or place at which his services may be engaged.

The Attorney General of Ohio, in response to inquiry of the Board, defines a public accountant as follows:

A person skilled in accounting; who is engaged in the business of examining and auditing the accounts of the general public; who applies his skill to the affairs of the community and to the books of any person, firm or corporation, that may submit the books for accounting, is practicing the profession of public accounting. He may or may not work for an accounting firm or be a member thereof.

The first year of the administration of the law, principally on account of its broad provisions, has been filled with many problems of vital concern to the public and the profession, and, I regret to say, has brought about some apparent discontent and alleged discrimination. One hundred and fifty-six applications have, to date, been filled for the degree of Certified Public Accountant by residents of Ohio and many other states of the Union, of which ninety-three certificates as Certified Public Accountant have been issued, a classified list of which is hereto appended.

The provisions of Section 5, known as the "waiver clause," were among the first to receive the attention of the Board and, as most of the

questions which have arisen during the administration of the law to date have been as to the construction of this clause, it is quoted in full herein as follows:

Any person who files his application within six months after the organization of the board and is at the time of filing such application a public accountant, and has practiced the profession of public accounting for at least three years, shall file with his application proof of such facts and proof that his general and special education is at least equal to the standard prescribed by this act. If the board shall be satisfied that the statements contained in such application and proofs are true and that the applicant possesses the general and special education required by the standard herein prescribed, it shall issue to the applicant a certificate as a certified public accountant without further examination.

As the Ohio law applies to any citiezen of the United States, and is not confined to residents of the state, as is provided in most other C. P. A. laws, difficulty has been found in this respect in dealing with applicants at long range. It was noted that our law practically re-opened the waiver clause of every state having similar laws, and relative to this provision, the Board adopted the following resolution:

Resolved, That this Board does not feel justified in furnishing application blanks to or receiving and considering applications from persons not residents of Ohio, but who are residents of states where a C. P. A. law is in effect, unless such person has received the title or degree of Certified Public Accountant (or its equivalent) or can furnish this Board with satisfactory reasons for not applying to and receiving such title or degree in the State wherein he (or she) is a resident.

Two mandamus proceedings have been filed against The State Board of Accountancy by applicants who, after a careful investigation and consideration by the Board, had been refused certificates under the waiver clause, the principal reason for such refusal being that, so far as could be ascertained from the information available, neither of the applicants had been engaged for the period of three years in the practice of the profession of public accounting, as required by statute.

In the case brought in the Circuit Court of Franklin County, Ohio, which is styled or entitled, The State of Ohio *ex rel* Forrest H. Figsby, Plaintiff, against J. S. M. Goodloe and others, defendants, the Court, on the 19th day of October, 1909, entered an opinion, which may be of far-reaching consequence to the Certified Public Accountants of this state and to the principles and purposes involved in the law. Referring to this opinion, it will be found that the Court is not in accord with The State Board of Accountancy in the definition of what constitutes the practice of the profession of public accounting. The court held, substantially, that while the Board in its action in refusing the certificate was acting in good faith, yet that the Board had exacted too high a standard of qualification and said:

The phrases "public accountant" and "has practiced the profession of public accountant for at least three years," used in the statute is the only

definition which can be legitimately employed by the Board in determining qualifications under Section 5. These words must be given their common and accepted meaning. A public accountant is one who serves the public as an accountant and the qualification of experience is fulfilled if public accountancy be the applicant's profession and if he have practiced it for a period of at least three years. Without attempting to put forth a definition, it is sufficient simply to say that the requirement as to maintaining a public office is not justified by the statute; nor is the objection made on the hearing and foreshadowed in the form of application that the accountant be in business on his own account, valid. It is not inconsistent with an applicant's being a public accountant that he be not in the business upon his own account; he may be in the employ of others, providing the work he actually does falls in the common acceptation of the employment of a public accountant. Nor is it necessary that he be exclusively engaged in the practice of public accounting for the period of three years. He must have held himself out during that period for the business of public accounting as a calling or occupation and that the profession be practiced as such for the specified period.

Chartered Accountants in New York.

The following letter, dated Jan. 18, 1910, appears in the *London Accountant* of January 29, and was presumably written by a hapless Briton now in New York, although the *Accountant* does not let its readers know whence its correspondents write.

SIR.—I notice in your issue of 8th inst. several advertisements for Chartered Accountants in "the States" and Canada, and wish to utter a note of warning to my younger Associates.

I have been in this country some years, and know a great many Chartered Accountants who are, or have been, assistants to firms over here. The salary offered seems good to the ordinary Britisher, but once he gets here his illusions vanish—the extra cost of living, clothing, and other necessaries (not counting luxuries) soon wipe out what appears to be a fair living margin. He also being a stranger and unaccustomed to conditions here is practically at the mercy of his employers, and my object in thus writing is to put any who have been attracted by the advertisements on their guard. To them I say, weigh the conditions carefully, and see that the salary offered is adequate to meet the altered conditions, and then take "Punch's" advice and *"don't"* come, as these same firms discharge or lay up men when business is slack.

Yours truly,
C. A.

New Members of Minnesota Board.

Mr. J. Gordon Steele, of the firm of J. Gordon Steele & Company, has been appointed member of the Minnesota State Board of Accountancy for one year. Mr. Steele is a Minnesota certified public accountant and a member of the Scottish Institute of Accountants and Actuaries.

Insurance Agents and Their Commissions.

The Financial Supplement of the *London Times* some time ago contained a well-written article dealing with the excessive growth of the system of paying life insurance companies. The fact that the subject has much current importance in the United States makes this expression of well-informed English opinion particularly interesting at this time. Some extracts from the article are given below:

The agency system began in the early days of insurance. At first the agent was remunerated by a moderate percentage of the premiums—usually 10 per cent. for the first year and 5 per cent. in subsequent years. For this he carried out all the details connected with the business, and in places remote from the company's headquarters he collected the premiums and remitted them to the office, a service more useful in those days than now, when banking facilities are brought to every man's door. By-and-by the pressure of competition suggested the expediency of encouraging the agents activity by allowing a larger remuneration for the introduction of business. At first bonuses were given to the agents reckoned on the amount of business they had introduced in the year. Then came the plan of allowing a fixed percentage on the amount insured and basing the remuneration still more on the original introduction. Thus the commission came to be for the first year £1 for every £100 insured ,and for subsequent years 2½ per cent. on the renewed premiums. An agent introducing an insurance of £1,000 at an annual premium of £30 received for the first year £10 and afterward 15s. at each renewal ,in place of £3 for the first year and £1 10s. in subsequent years as under the old 10 per cent. and 5 per cent. arrangement.

By and by, however, the exigencies of competition and the desire for large figures led one company after another to bid higher for new business until now it is not uncommon to hear of 50 per cent. and even 100 per cent. more being paid for the introduction of insurances. Had this retrograde movement been confined to the smaller and weaker offices, it need have caused neither surprise nor perhaps any great regret, but unfortunately it has spread until not a few offices bearing well-known names have yielded to it. Instead of setting their faces against growing encroachments on the profit margin, managers have been eager to purchase business at whatever cost, and have flattered themselves that they were showing enterprise and moving with the times, when in fact they were weakly giving in to demands which have no reasonable limit.

To one who has witnessed the origin and growth of this unwholesome form of competition, it is evident that, unless some stand is made, things are likely to go on from bad to worse. If offices are found one day advancing commissions from 20s. to 25s. and 30s. per cent., others are soon found who will give 40s., and these again are likely to be outbid by others; the interests of the insured being more and more encroached upon as the process goes on. Why then, it may be asked, is the practice allowed to continue unchecked? The answer seems to be that, owing to a mistaken sense of what constitutes real progress and prosperity, officials gain credit in the eyes of their directors, and directors in the eyes of their constituents, in proportion to the magnitude of the business transacted. This, as has been shown, is no real test of prosperity and good management, but it is a popular one and easily applied. The first step toward checking the evil described will be the recognition on the part of directors and the public that big figures do not necessarily spell prosperity, but may very easily lead to its opposite.

As in other departments of life and of business, one evil usually brings others with it, so in this case together with the excessive growth of commissions there have sprung up other practices no less reprehensible. So long as the agent received a reasonable allowance for his services it did

not occur to any one to divert the payment from him. Now, however, that business men hear of large commissions ,they naturally seek to obtain the benefit for themselves when they contemplate insurance. Hence has arisen the custom, now unfortunately not uncommon, of allowing a person who demands it the commission on his own insurance. The proper use of commission as a payment for services rendered is thus abandoned, and the policyholder receives in effect a discount or rebate on his premium, at the cost and to the prejudice of others who are not so favored, while he obtains his full share of the profits and other advantages to which his fellow policyholders are entitled. Some offices do not even stand upon the refinement of a discount or commission, but are ready in case of competition to accept a lower rate of premium from one insurer than they do from others, a clear violation of the first principles of fair dealing.

There is reason to hope that a check upon some of those evils may be attempted, but there is no sign as yet of any effort on the part of the offices to stop the needless and wasteful competition in rates of commission. Is it too much to hope that common sense and sound principal may prevail in this matter? It needs only, on the part of directors with whom the real responsibility lies, an awakening to the obviously evil tendencies at present in operation to ensure their being checked to the great benefit of the offices themselves and of their individual policyholders.

Professional Auditing of Financial Institutions.

Thorough examination is a paramount necessity in every financial institution. To lack of it are attributable bank, trust company and other corporate disasters, for, broadly speaking, there is not a failure, serious loss or defalcation that could not have been obviated by timely and thorough auditing. Many corporations place themselves in the hands of professional auditors, regularly retained and designated in their official personnel lists and assigned in the by-laws to the important duty of periodically making independent audits of the books and accounts, with examination of securities, and of reporting upon the same direct to the board of directors.

Such should be the rule and practice of every financial institution. Some few banks and trust companies have, it is noteworthy, already adopted this salutary precautionary method.

Once every year at least one of the recognized audit companies should eb retained to make a comprehensive and absolutely unbiased independent audit. * * *

Many advantages would flow from the adoption of such an annual audit. The officers dispensing credit for the institution would be more guarded in accepting transactions containing possible germs of loss, and the employes would observe the utmost punctilio in having the cash, bills, securities and accounts in their charge immaculately accurate, realizing that in the contrary case nothing can escape the all-discerning experts who might, without a moment's notice, commence an audit which to the unfaithful would mean swift discovery and condign disgrace.

Nothing could so enhance the standing and elevate in public opinion institutions thus enabled to hold aloft in publicity literature, window and counter signs, forms, stationery and advertising the "clean bill of health" furnished by well-established auditing concerns.—*Financial Age.*

The Legal Liability of Auditors.

The recent decision of the Second Division of the Court of Session at Edinburgh, reviewing the judgment of Sheriff Millar in the action of M. W. Robertson & Co. v. Nairn, Bowes & Craig (a full report of which appeared in our last issue), raises various points of considerable interest to our readers, although it must be confessed that none of them appear to have been settled in a manner that can be regarded as altogether satisfactory. In this case the plaintiffs claimed £720 or thereabouts, as being the loss and damage sustained by them through the misappropriation of the funds of the partnership by Thomas Robertson, deceased, formerly a partner in their firm, through the alleged gross carelessness of the defendants in not detecting his defalcations in the course of their annual audit of the plaintiffs' accounts. The defence was that the defendants had duly performed the work that they had been employed to perform, that there had been no negligence upon their part, and that any loss that might have been incurred by the plaintiffs was not due or attributable to any fault or negligence of theirs. They further pleaded that the plaintiffs had no title to sue, having transferred their business to a limited company. The Sheriff appears to have decided the case only on the question of the plaintiffs' title to sue, and to have decided it against them. On appeal, the Court of Session dismissed the action as irrelevant, on the ground that there was not sufficient specification of the acts in which the auditors had failed in their duty, without expressing any opinion on the question of title.

It appears that for a number of years the plaintiffs' accounts had been made up annually by the defendants, who affixed to the Balance Sheet prepared by them a certificate signed by a member of their firm in the following terms: "I have examined the books of Messrs. M. W. Robertson & Co., Avon Steel Works, Glasgow, for the year ending 30th June, 19—, and I certify the foregoing Balance Sheet to be correct, and in accordance with the books."

We gather that, for the most part, the alleged defalcations consisted of sums overcharged as wages to the men paid by the late Thomas Robertson, and put into his own pocket. The plaintiffs' case, which seems to have been forward in quite general terms, was that it was the duty of the defendants to make a complete investigation of the books and vouchers of the firm, so as to ascertain the true position of affairs, and that that duty must have been performed negligently or else the alleged defalcations would have been discovered. From the point of view of the profession generally, it would have been interesting in the extreme, had this case been argued strictly on its merits as to how far the auditor to a partnership firm is justified in accepting as facts the statements and certificates of individual partners, and as to how far it is his duty to view all their accounts and statements with suspicion, and to test them thoroughly with the aid of the best available documentary evidence. But actually, the Court does not appear at any stage to have got within measurable distance of even considering the matter from this point of view. Neither, apparently, was it thought necessary to take into account the nature of the wording of the defendants' certificate;

to inquire what was meant by the words: "I certify the foregoing Balance Sheet to be correct"; or in any other way to grapple at close quarters with the real points involved. On the contrary, the Division appears to have decided the case solely on technical grounds; that the plaintiffs' case was put forward in such general terms that the defendants ought not, in fairness, to be called upon to answer it; and, so far as we can gather, solely on the ground that the charge was brought on such general terms, judgment was delivered in the defendants' favor with costs.

Of course, it goes without saying that it is desirable in the interests of the profession that auditors should be protected from having to meet vague charges of breach of duty; that where breach of duty is alleged, a specific statement should be furnished of the precise points wherein it is alleged that such breaches have occurred; but it is never altogether satisfactory when a case raising issues of vast importance is thus disposed of on purely superficial objections. To mention one reason only, one has to consider the possible effect of such a decision on the general public, and its bearing on the view that the man in the street will form as to the value of a professional audit. In this case it was apparently not contested that the auditors had certified the Balance Sheet to be "correct," whatever that may mean, and that, notwithstanding this, one of the partners had succeeded in defrauding the partnership of large sums of money. In such a case it seems most desirable that the reason (if any) why the partnership should have no ground of action against the auditors should be very clearly stated, if the public are not (rightly or wrongly) to draw the general conclusion that a professional auditor's certificate as to the accuracy of a Balance Sheet means nothing, and involves no responsibility on the part of the auditor.—*London Accountant.*

Book Department.

EDITED BY LEE GALLOWAY, Ph. D.

CYCLOPEDIA OF COMMERCE, ACCOUNTANCY, BUSINESS ADMINISTRATION. Published by American School of Correspondence. 10 Volumes. 1910. Chicago. Price $24.00.

A general idea of the scope of the work may be gathered from the title page which characterizes these volumes as a general work on Accounting, Auditing, Bookkeeping, Commercial Law, Business Management, Administration and Industrial Organization, Banking, Advertising, Selling, Office and Factory Records, Cost Keeping, Systematizing, etc. The preparation of the cyclopedia under the able management of James B. Griffith is credited to a large corps of auditors, accountants, attorneys and specialists in business methods and management.

The appearance of this work should be highly appreciated by student and business man alike. Much "literature" on business topics is before the public today, but this cyclopedia is a successful attempt to collect the knowledge of present day business practice and policies and to give it to the world in such form that the investigator can have, in a convenient shape for ready reference, a reliable source of business information.

In addition to covering the general business field the publishers have included much business practice that is special in its nature. Thus the person who is especially interested in department store accounting and management, or in these subjects as applied to real estate, insurance, contractors, publishers and printers will find them treated satisfactorily in these columns. It is the intention of this department of the JOURNAL to review from time to time the various volumes.

The first two volumes may be considered as a unit from the point of view of business organization. The material gathered here treats of an enterprise from the standpoint of the various departments, their duties, the systems employed in gathering and recording data, and their functional nature. This is given in detail yet without that prolixity and repetition which characterizes so much of the literature upon business appearing in current magazines or in the books which appear later with the same material under alluring titles and suggestive topical headings but with the information sought for in the text so vaguely presented that nothing definite either from point of view of business ethics or business practice can be deduced from the pages.

Furthermore, it is pleasing to note that these two volumes have not gone to the opposite extreme of a dry and technical presentation. The language is simple and the method direct. The plans, policies, problems and systems which the authors present as entering into the conduct and structure of business organization are easily followed—and what is more important—followed with profit to the reader.

It would be difficult to give a full statement of all the material covered in the first two volumes, but the following brief analysis will be suggestive of the many other valuable things which may be found here.

(1) Administrative and Industrial Organization. This covers the principles that can be universally applied to industrial and mercantile enterprises both in the relations of the industries to the economic world in general and to the departmental relations arising within the business unit itself.

(2) Advertising and Sales Organization. Little is said here pertaining to the theories, the author confining himself to a description of typical methods of recording the data and systematizing the office work connected with these two departments.

(3) The Credit Organization. This chapter deals with the information required by a credit man, the analysis of statements and the relative importance of the various kinds of information considered in connection with its sources.

(4) The Shipping Department. This chapter not only treats fully of the internal organization but it goes outside the plant and considers such questions as class and commodity rates, freight tariffs, routing shipments, the various delivery systems, etc.

(5) Correspondence and Filing, and (6) Business Statistics embrace together over 150 pages and, as might be expected, considerable space is given to forms, pictures and diagrams pertaining to these departments.

Volume II continues the departmental organization by a detailed consideration of (1) the Purchasing and Stores Department, (2) Records of Labor and Manufacturing Orders, (3) General Expenses. (4) Cost Summaries, (5) Machine-Shop Management, (6) Cost-Analysis Engineering.

The most unsatisfactory chapter of the second volume is that pertaining to wage systems. The treatment of this important subject is seldom given with sufficient clearness. The Taylor, Halsey, Gantt and Emerson Systems should be stated in such a manner that no doubt can arise as to fundamental distinctions between them. Diagrams illustrating the various wage systems should not be given unless fully explained. Here no explanation is given and the reader is left to guess at the interpretation to be put upon the various lines and spaces. And again the position of the subject, coming as it does before the treatment of general expense and cost summaries, demands that emphasis be put upon the subject of *standardization*. Efficient wage systems depend upon the accuracy of the standards determined by the efficiency engineer and in this connection it would have been highly profitable to have discussed the various standards demanded by modern concerns. The relation of efficiency standards in business to cost keeping is only just beginning to be thoroughly appreciated and hence it should be emphasized by giving it a prominent position in any book dealing with business organization and efficiency. The compiling of data without a standard of efficiency with which they are to be compared is about as profitable as the taking of notes by a reporter at a race where the horse is running against time but where no one has a stop-watch or knows what records have been made before.

This defect is in part atoned for by an excellent chapter at the end

of Volume II on the Cost-Analysis Engineer. Various efficiency charts, card systems, etc., are given by which the cost system may be aided in giving not only accurate but timely information, and the whole is clearly illustrated by a concrete example involving the collection and analysis of cost data pertaining to construction work.

In closing this general survey of these books it should be noted that each chapter is supplemented by a series of well selected quizz questions which thoroughly test the student's knowledge of the subject matter contained in the book.

THE A B C OF TAXATION. By C. B. Fillebrown. Published by Doubleday, Page & Co., New York, 1909. Pages 229, illustrated. Price, $1.20.

The title of this book more properly might have been, The A B C of the Economics of Urban Real Estate. The misnomer of the title indicates the general character of the work. The result achieved is greater than the end sought. The author, who is president of the Massachusetts Single Tax League, is like Saul the son of Kish, who, in Bagehot's phrase, "went in search of his father's asses and found a kingdom."

Mr. Fillebrown sets out to prove after the manner of his sect the old thesis of the desirability of the single tax; but, such are the original methods of his proof that he makes a discovery of the first order of importance. This is that under modern conditions (at least as they exist in such places as Boston) the institution of private property in urban land has temporarily broken down—it no longer serves the ends of society. Municipal and corporate expenditure of huge sums on subways and other public service improvements simply pumps more value into the land and leaves the buildings for the most part the same old out-of-date, inadequate affairs they were before. It will take one hundred and seventy years, it is shown, to rebuild Washington Street, Boston (between Adams Square and Eliot Street), at the rate that rebuilding has gone on during the past two decades. Pursuing laboratory methods of a most painstaking sort, Mr. Fillebrown demonstrates by means of tables of property sales, rentals, comparative assessments of land and buildings, that an insuperable obstacle, as things now are, stands in the way of our ever getting a new and better physical Boston. He demonstrates that the ownership of land in cities is a business "affected with a public interest," and that the situation calls loudly for government interference because that interest is not well served.

But while our author is highly successful in demonstrating the nature of the social-economic disease that has grown upon us, he is not so successful as regards the remedy. It seems to the present writer that for the great work in hand the "single tax" is both economically inadequate and legally inappropriate. Not the "power of taxation," but the "right of eminent domain" is the governmental instrument that should be seized by society to cure this important disorder. Let the statutes limiting the exercise of the right of eminent domain be radically amended, and then let

an honest, courageous, far-sighted city government take hold with vigor and join little lot to little lot until there are parcels of usable size according to modern conditions of commerce and the locality; let whole sections of the city be entirely relaid out with new streets and avenues, and the shape and size of the blocks completely changed. The way being thus prepared, private enterprise can be depended upon to rebuild the city. (The city itself had better not undertake that work.) Unless the way is thus prepared the rebuilding so much needed will not come about at all. It is physically impossible.

A remodeling of the general system of taxation, which would include certain features of the single taxer's project of reform (especially the extension of the theory and practice of "special assessments" and the taxing at full value of unimproved land), would help powerfully in carrying out the vast undertaking outlined above, but it is not essential. Fundamentally it is an engineering and legal, not an economic or fiscal, situation that blocks the path of progress. C. W. M.

COMMERCIALISM AND JOURNALISM. By Hamilton Holt. Houghton, Mifflin Company. 105 pages. 1909. Price $1.00 net.

As the name indicates, this little book is a statement by the editor of the *Independent* of the importance of commercialism in journalism. We are led to the conclusion that journalism is no longer a profession but a business. In enumerating the causes of the enormous growth of the "periodical industry," Mr. Holt names advertising as the main factor in the case. He says that the most significant thing about modern journalism is the power of advertising, that it has economized business by bringing the producer and consumer into more direct contact, that the individuality of the great editor is becoming less and less a power, finally vanishing into "innocuous anonymity," and that the press agent both for legitimate and illegitimate purposes is the most important factor in giving publicity to various projects.

After dwelling at length on the sordid side of journalism, the author concludes that the news, the efficiency, the accuracy and the ability of the American press were never on such a high plane of excellence as they are at present. In closing, he makes some practical suggestions as to methods of cutting down commercialism in journalism to such a point that it will cease to be a reproach to American papers.

Legal Department.

EDITED BY CHARLES W. GERSTENBERG, Ph.B., LL.B.

The Legal Department of THE JOURNAL OF ACCOUNTANCY is prepared to render a genuine service to its subscribers and readers, by undertaking to answer legal questions submitted to it. These questions, while they may be suggested by the problems that arise in the practice of our correspondents or by the more theoretical requirements of examination boards, should always be stated as to call for single propositions of law. Whenever the department receives a query the correct answer to which may vary with many possible but unstated circumstances the correspondents will be asked to give the details or advised to consult local counsel. Reasonably prompt replies by the Department will be made by personal communcation or through the columns of THE JOURNAL. Address all communications to the JOURNAL OF ACCOUNTANCY, Legal Department, 32 Waverly Place, New York City.

BILLS AND NOTES.

Various interesting and ingenious arguments were used in a case that recently came before the Court of Appeals in the State of New York. The objections to be made to all of the arguments can be assembled into this rule: *The Statute of Limitations cannot be stopped from running against a debt by any act of the creditor.* Thus, though the creditor bank had the right to sell at private sale the collateral given to secure a note and to apply the proceeds in liquidation of the debt, and though for that purpose it can be looked upon as the agent of the detor, its authority stops there and the application of the proceeds of the sale will not constitute such a part payment as is necessary to extend the period of limitation. Nor does the silence of the debtor after having received notice of the sale of the securities and the application of the proceeds, imply a ratification of the acts of the bank so as to raise the legal implication of a new promise to pay the balance of the debt. Perhaps the most novel argument of the bank was its attempt to show that the contract to pay the whole debt was different and separable from the contract to pay the balance due after the proceeds of the sale of the collateral had been applied and that inasmuch as the balance was not ascertainable till the sale had taken place the contract could not be said to arise till that time and hence that the statue of limitations could not begin to run till then. Of course the court paid little attention to this sophistry. The rule, given above (in italics) is convenient; part payments, new promises to pay, absence from the jurisdiction, all are acts of the debtor and they alone together with the death of the debtor are sufficient to affect the running of the Statute. BROOKLYN BANK vs. FRANK A. BARNABY, New York Law Journal, Jan. 24, 1910. Decided January 4, 1910.

TAXATION.

The question of taxation is more and more taking on an aspect which will soon place it amongst the legal questions of first importance to accountants. We propose, therefore, to add this subject to the list of divisions under which from time to time important cases will be noted. A decision illustrating one point which should be familiar to corporation accountants is the following:

"One of the principal questions discussed in this case originally was whether, where the net earnings rule is adopted in valuing a special franchise, the taxes paid by the relator should be deducted from the gross earnings in order to determine the net earnings of the taxpayer." (It will have been noted by the readers of THE JOURNAL OF ACCOUNTANCY who read the article on the "Consolidated Gas Case," issue of March, 1908, that the United States Supreme Court in that decision directed that for the purpose of determining the net return on investment in public service corporations the amount of the tax should be deducted. In that case, as in the one now under discussion, franchise taxes cannot be deducted from gross earnings to find the net earnings until they have been actually paid.)

"In cases where the net earnings rule is an appropriate method for valuing a special franchise, the first step is to ascertain the gross earnings of the corporation, and the second step is to deduct the operating expenses. Among the operating expenses are to be included all the taxes which have accrued against and have been paid by the corporation during the period in which the net earnings are taken as the basis of the valuation. The taxes include any special franchise tax which has been assessed against the corporation for that, or in that, period, and which the corporation has actually paid. A special franchise tax, however, which has not actually been paid, is not to be deemed a part of the operating expenses, and cannot properly be included in the deductions made on account of such expenses. If the corporation has chosen to resist the payment thereof, by litigation or otherwise, it cannot fairly be considered as having been subject to an expenditure when it has kept the amount of the tax in its own treasury. Only such special franchise taxes as have in fact been paid are, therefore, to be treated as a proper deduction from the gross earnings in valuing a special franchise according to the net earnings rule."

This is a concise, clear and authoritative ruling of the highest court in New York. PEOPLE EX REL. JAMAICA WATER SUPPLY CO. VS. STATE BOARD OF TAX COM'RS, 90 N. E. REP. 112. (Dec. 7, 1909.)

TAXATION OF TRANSFERS OF STOCK.

"The provision of the Tax Law relating to the taxation of transfers of stock, requiring brokers to keep a book of account showing their stock transactions for the inspection of the comptroller, is a valid and constitutional enactment. (Sec. 276).

"The further provision of the section giving to the comptroller the right to examine the books, papers and memoranda of a broker purports to authorize that officer to make a compulsory general examination of all his private books and papers to ascertain if the book of account was properly kept and the tax paid as required by statute."

"A demand upon a broker by a representative of the comptroller under a certificate from that office to inspect and examine his books, memoranda, records and papers, and the entries therein of his stock transactions is equivalent to demanding an examination of his private books and papers."

"That part of the section purporting to authorize an examination of private books and papers, whereby evidence might be obtained as the basis of criminal proceedings for violation of the statute, is void, being in conflict with the constitutional guaranty against compelling a person in any criminal case to be a witness against himself. (State Constitution, Sec. 6, Art. 1.)"

"The invalidity of this provision does not, however, affect the general scheme of the statute for the taxation of stock transfers, it being a separate and independent provision." Decided January 11, 1910, PEOPLE EX REL JOHN S. FERGUSON VS. EDWARD REARDON, *N. Y. Law Journal,* January 21, 1910, Court of Appeals, N. Y.

Questions and Answers.

1. J. B., New York City.—"On what grounds was the Ice Trust convicted, and in what court was the case tried? Can the company appeal?"

The American Ice Co. was tried before Judge Wheeler and a jury in a Trial Term of the New York Supreme Court. The issue having been in the hands of a jury no opinion is reported, but the judge's charge to the jury will be found in 120 New York Supplement at page 443. The State statute known as the "anti-monopoly act" (Consolidated Laws., C. 20, secs. 340-6) under which the defendant was tried is not very unlike the Sherman anti-trust act. For example, the judge quoted from the Northern Securities decision, a case decided under the Sherman act, to illustrate what is meant in the State statute by restraint of competition. An appeal can be taken from the judgment entered on the jury's verdict. It is unnecessary to go into all the legal requirements, but in general it may be said that the appeal may be based on the following grounds. That the conviction is against the weight of evidence, that improper and prejudicial testimony was admitted, or that the judge's charge to the jury was an incorreect exposition of the law.

2. M. Mc G., Buffalo, N. Y.—"What are the provisions of the New York Statute of Limitations? Where can I find the Statutes of Limitations of other states?"

The New York Statute of Limitations will be found in the Code of Civil Procedure, Chapter IV. The principal provisions may be summarized as follows: (We omit real estate actions and other special proceedings.)

The period runs for twenty years on

1. Judgments.
2. Sealed instruments.

The period runs for six years on

1. Simple contracts.
2. Statutory liabilities except penalties and forfeitures.
3. Actions for damages for injuries to persons or property (except where a different period is hereafter prescribed).
4. Actions to recover chattels.

5. Actions on fraud except for the recovery of money damages, (i. e., certain equitable actions).
6. An action to establish a will. The statute begins to run on the discovery of the will.

The period runs for two years on

1. Actions for negligence.
2. "Against an executor, administrator, or receiver, or against the trustee of an insolvent debtor * * * brought to recover a chattel, or damages for taking, detaining, or injuring personal property * * * "
3. Certain other actions against certain officers or for certain penalties and forfeitures.

The period runs for two years on

1. "An action upon a statute, for a forfeiture or penalty to the people of the state."
2. "An action to recover damages for libel, slander, assault, battery, seduction, criminal conversation, false imprisonment, malicious prosecution or malpractice."

The period runs for one year on actions against certain named officers for certain named violations of duty.

Where an action is on an open account the period of six years begins to run from the time of the last item.

Actions not provided for are "outlawed" after a period of ten years.

Hubbel's Legal Directory contains a convenient compendium of the statutes of all states. The main provisions of the statutes of limitations will be found summarized in this book, published annually.

Navy Yard Accounting.

It is announced that the Secretary of the Navy intends to continue the employment of the skilled accountants who have been engaged at the Boston Navy Yard with the installation of a central accounting system. The cost of the appraisal and installation at Boston was $20,000, but it is estimated that the installing of a much larger office at New York will cost less than $10,000.

Annual Meeting of New Jersey Society.

The annual meeting of the New Jersey Society of Certified Public Accountants was held at Newark, February 8, and the following officers were elected: President, John E. Cooper; Vice President, William T. Sawyer; Secretary, Frank G. DuBois; Treasurer, Edwin G. Woodling; Trustees, the officers and T. Cullen Roberts, Edwin E. Gano and Clarkson E. Lord; Auditors, James M. Lewis and William H. Beidelman.

C. P. A. Question Department.

Conducted by LEO GREENDLINGER, M. C. S.

Criticism and exchange of ideas will clear many a doubt and at the same time improve shortcomings. To solve, compare and criticise C. P. A. examinations, is the object of this department. With the aid of suggestions and criticism from the professional brethren, it can undoutedly be achieved. Inquiries will be cheerfully answered.

Following are the second and fourth problems in Practical Accounting set by the Michigan State Board of Accountancy in July, 1909, with solutions.

Problem 2.

X, Y and Z, foundry men, unable to meet their obligations, suspend payment January 1, 1908, and appoint a trustee to realize and liquidate for the benefit of their creditors. The books showed the following assets and liabilities:

ASSETS		LIABILITIES	
Land and Buildings	$125,000.00	Mortgage on Foundry Premises	$100,000.00
Machinery & Tools	75,000.00	Notes Payable	135,000.00
Furniture & Fixtures	10,000.00	Accounts Payable	105,000.00
Materials & Supplies	95,000.00	Interest accrued on Mortgage	1,250.00
Notes Receivable	15,000.00	Taxes accrued (estimated)	835.00
Accounts Receivable	115,000.00	Capital	93,365.00
Cash	450.00		
	$435,450.00		$435,450.00

The trustee's cash receipts and payments during the year 1908 were as follows:

RECEIPTS		PAYMENTS	
Notes Receivable (Outstanding January 1, 1908)	$15,000.00	Notes Payable	$25,000.00
Accounts Receivable (Outstanding January 1, 1908)	106,500.00	Accounts Payable	35,000.00
Cash Sales	5,435.00	Interest on Mortgage one year at 5%	5,000.00
Notes Receivable (Contracted during 1908)	13,500.00	Taxes for year 1907	865.00
Accounts Receivable (Contracted during 1908)	212,000.00	Purchase of Material and Supplies	98,000.00
		Labor	135,000.00
		General Expenses	45,000.00
		Interest on Bills Payable to Sept. 30, '08 at 5%	2,800.00
Total Receipts	$352,435.00	Total Payments	$346,665.00

Other transactions were as follows:

Sales on Credit		$335,000.00
Bad debts written off accounts prior to Jan. 1, 1908	$8,000.00	
Bad debts written off accounts subsequent to Jan. 1, 1908	2,000.00	10,000.00
Discounts and allowances to Customers' Accounts prior to January 1, 1908	$500.00	
Discounts and allowances to Customers' Accounts subsequent to January 1, 1908	300.00	800.00
Notes received from customers		20,000.00
Notes given to creditors ($110,000.00 being renewals)		180,000.00
Inventory of Materials, December 31, 1908		92,000.00

At the end of the year the business was returned to the owners. Prepare realization and liquidation account; and balance sheet.

Solution 2.

Realization and Liquidation Account rendered by the Trustee of X, Y and Z.

ASSETS TO BE REALIZED:

Notes Receivable.	$15,000	
Accounts Receivable.	115,000	
Materials & Supplies	95,000	
Furniture & Fixtures.	10,000	
Machinery & Tools.	75,000	
Land & Buildings	125,000	$435,000.00

LIABILITIES TO BE LIQUIDATED:

Notes Payable.	$135,000	
Accounts Payable.	105,000	
Taxes accrued	835	
Mortgage	100,000	
Interest on mortgage accrued.	1,250	$342,085.00

LIABILITIES LIQUIDATED:

Notes Payable	$25,000	
Accounts Payable	35,000	
Taxes accrued	835	
Interest accrued on mortgage.	1,250	$62,085.00

ASSETS REALIZED:

Notes Receivable	$15,000	
Accounts Receivable	106,500	$121,500.00

LIABILITIES NOT LIQUIDATED:

Notes Payable	$110,000	
Accounts Payable	70,000	
Mortgage Payable	100,000	$280,000.00

ASSETS NOT REALIZED:

Furniture & Fixtures	$10,000	
Machinery & Tools	75,000	
Land & Buildings	125,000	$210,000.00

SUPPLEMENTARY CHARGES:

Purchase of materials & supplies	$168,000	
Labor.	135,000	
General Expense.	45,000	
Interest on mortgage (including accrued $1250.)	5,000	
Interest on Notes Payable	2,800	
Taxes, balance for 1907 $30. Estimate for 1908 $865	895	$356,695.00
		$1,133,780.00

SUPPLEMENTARY CREDITS:

Sales on credit	$335,000	
Cash Sales	5,435	$340,435
Less bad debts (1908 only)	$2,000	
Discounts & allowances (1908 only).	300	2,300
		$338,135
Inventory of materials & supplies		92,000 $430,135.00
Net Loss		30,060.00
		$1,133,780.00

BALANCE SHEET OF THE FIRM X, Y AND Z AS OF DECEMBER 31, 1908

ASSETS:				LIABILITIES:			
Cash in possession of trustee		$6,220		Notes Payable	$180,000		
Notes Receivable	$6,500			Accounts Payable	70,000	$250,000	
Accounts Receivable	100,700	$107,200					
				Mortgage on Foundry Premises		100,000	
Inventory of Materials and supplies		92,000	$205,420				
				Accrued interest on mortgage	$1,250		
Land and Buildings		$125,000		Accrued taxes	865	2,115	
Machinery and Tools		75,000					$352,115
Furniture and Fixtures		10,000	210,000				
				PROPRIETORSHIP:			
				Capital Jan. 1, 1908	$93,365		
				Deduct losses as per Realization and Liquidation account	30,060		
				Capital Jan. 1, 1909			63,305
			$415,420				$415,420

Problem 4.

On January 1, the Fairview Real Estate Association was incorporated, the capital subscribed and paid in being $30,000, divided into 30 shares. The association purchased improved property for speculative purposes, paying cash $30,000.00 and giving a first mortgage for $60,000.00 at 6%.

The association organized and incorporates on the same day the Fairview Club with 30 proprietary members (being the stockholders of the real estate association) and 30 associate members who have no proprietary interest, but enjoy all privileges without incurring any of the liabilities. The annual dues are $100.00 a year, paid by all in advance.

The association leases to the club the property aforesaid, the consideration in lieu of rent, being the payment by the club of all sums for taxes, betterments, interest, fixtures, furniture, etc.

The proprietary members are assessed $300.00 each, and by a subsequent resolution of the association are to receive credit therefor, with interest at 6%. Five members fail to pay the assessment.

The association having executed a contract for the sale of the property for $110,000.00 the club disbands at the end of the year.

The club expenditures for the year were as follows; Taxes $1,800.00; interest on mortgage $3,600.00; Repairs $1,000.00; Improvements $3,000.00; Furniture and fixtures $2,000.00; General Expenses $500.00 Help (sundry employees) $1,600.00.

There were house charges against the members $500.00, which were subsequently collected; and there were payable book debts of $4,000 00. A second assessment of $100.00 called for to pay off the club debts, was paid by the proprietary members of the association.

Frame journal entries, raise and close accounts on the association and club books, and prepare balance sheet and revenue account for each

Solution 4.

JOURNAL

OF THE

FAIRVIEW REAL ESTATE ASSOCIATION,

January, 1909.

THE FAIRVIEW REAL ESTATE ASSOCIATION,

A CORPORATION ORGANIZED JANUARY 1, 1909, UNDER THE LAWS OF THE STATE OF——, WITH A CAPITAL SUBSCRIBED AND PAID IN OF $30,000.00, DIVIDED INTO 30 SHARES, EACH $1,000 PAR.

Subscribers	$30,000.00	
For their shares of subscribed stock of The Fairview Real Estate Association.		
To Capital Stock		$30,00.000
Issued to the subscribers, as per their subscriptions.		
Cash	30,000.00	
Payments of subscribers for their subscription.		
To Subscribers		30,000.00
Being settlement for capital stock issued.		

Real estate.....	$90,000.00	
Purchased this day for speculative purposes.		
To Cash.....		30,000.00
Part payment for improved property bought this day.		
First mortgage.....		60,000.00
For balance of purchase price of property bought with 6% interest.		
The association organizes and incorporates the Fairview Club with 30 proprietary members (stockholders of the Real Estate Association) and 30 associate members, who have no proprietary interest, but enjoy all privileges without incurring any liabilities. Annual dues to be $100.00.		
The association leases to the club their property, for the payment by the club of all taxes, betterments, interest, fixtures, etc.		
Cash.....	110,000.00	
Selling price realized on the sale of the property of the association.		
To Real Estate.....		110,000.00
Sale of the improved property.		
First mortgage.....	60,000.00	
Settlement of mortgage issued at the time of purchase of real estate.		
To Cash.....		60,000.00
The property being sold, the mortgage is now settled.		

LEDGER

OF THE

FAIRVIEW REAL ESTATE ASSOCIATION.

Subscribers.

To capital stock....	$30,000.00	By cash.....	$30,000.00

CAPITAL STOCK.

		By subscribers.....	$30,000.00

CASH.

To subscribers.....	$30,000.00	By real estate.....	$30,000.00
Real estate.....	110,000.00	First mortgage....	60,000.00
		Balance.....	50,000.00
	$140,000.00		$140,000.00
To balance.....	$50,000.00		

REAL ESTATE.

To sundries.....	$90,000.00	By cash.....	$110,000.00
Income.....	20,000.00		
	$110,000.00		$110,000.00

FIRST MORTGAGE.

To cash.....	$60,000.00	By real estate.....	$60,000.00

INCOME AND REVENUE ACCOUNT.

To surplus.....	$20,000.00	By real estate.....	$20,000.00

SURPLUS.

		By income and revenue account.....	$20,000.00

BALANCE SHEET.

Cash.....	$50,000.00	Capital.....	$30,000.00
		Surplus.....	20,000.00
	$50,000.00		$50,000.00

JOURNAL

OF THE

FAIRVIEW CLUB.

THE FAIRVIEW CLUB

ORGANIZED BY THE FAIRVIEW REAL ESTATE ASSOCIATION WITH 30 PROPRIETARY MEMBERS, AND 30 ASSOCIATE MEMBERS. ANNUAL DUES, $100.

Cash.....	$6,000.00	
Dues received from the 60 members of the club.		
To Dues.....		$6,000.00
Collected from the proprietary and associate members, each $100.00.		

The club agrees to lease the property of the Real Estate Association and in consideration of rent to pay all taxes, interest charges, repairs and improvements of the association.

Members (indiv.)	$9,000.00	
For assessment of $300.00 each proprietary member		
To Assessment		9,000.00
Assessing the 30 proprietary members.		
Cash	7,500.00	
Collected of 25 members the assessment levied.		
To Members (indiv.)		7,500.00
For cash assessment of $300.00 each, paid by the 25 proprietary members.		
Assessments	7,500.00	
According to a subsequent resolution of the association the responded assessment is credited to the members individually.		
To Members		7,500.00
Crediting each member individually with the responded assessment.		
Cash	3,000.00	
Collected another assessment, levied upon the proprietary members.		
To Assessment		3,000.00
Proprietary members responded to a second assessment of $100.00 each.		
Assessment	1,500.00	
To Members (indiv.)		1,500.00
This entry to close the accounts of the five members who failed to respond with the first assessment of $300.00 each.		
Expenses		13,500.00
Taxes	$1,800.00	
Interest on mortgage	3,600.00	
Repairs	1,000.00	
Improvements	3,000.00	
Furniture and fixtures	2,000.00	
General expense	500.00	
Help (employment)	1,600.00	
To Cash		13,500.00

LEDGER

OF THE

FAIRVIEW CLUB.

Dues.

To income	$6,000.00	By cash	$6,000.00

CASH.

To dues	$6,000.00	By expense	$13,500.00
Members	7,500.00	Balance	3,000.00
Assessment	3,000.00		
	$16,500.00		$16,500.00
To balance	$3,000.00		

MEMBERS.

To Assessment	$9,000.00	By Assessment	$7,500.00
Balance	7,500.00	Cash	7,500.00
		Assessment	1,510.00
	$16,500.00		$16,500.00
		By balance	$7,500.00

ASSESSMENT.

To members	$7,500.00	By members	$9,000.00
Members	1,500.00	Cash	3,000.00
Income	3,000.00		
	$12,000.00		$12,000.00

EXPENSE.

To sundries	$13,500.00	By revenue	$13,500.00

INCOME AND REVENUE ACCOUNT.

To expense	$13,500.00	By dues	$6,000.00
		Assessment	3,000.00
		Loss	4,500.00
	$13,500.00		$13,500.00

DEFICIENCY ACCOUNT.

To income account	$4,500.00

BALANCE SHEET.

Cash	$3,000.00	Members	$7,500.00
Deficiency	4,500.00		
	$7,500.00		$7,500.00

Comments.

If the two problems solved here were original, there would be no question of the Board deserving all possible commendation. As it is, however, both problems have been set before, at the New York C. P. A. examinations, and it is doubtful whether it is good practice to repeat the same problems without the slighest change in wording or appearance. This is especially true when we notice that at the last (February, 1910) New York State C. P. A. examination in Practical Accounting the Board also followed that method. Out of the six problems presented, four were old. If the C. P. A. examiners are going to continue such procedure it will unquestionably put a premium on cram work.

In the solutions the realization and liquidation account is prepared in the ordinary form, showing on the debit side the assets to be realized and omitting the item of cash as this is already realized. Comparing the total of this heading with the totals of the headings "Assets Realized" and "Assets Not Realized," we find a difference of $103,500.00. In this balance is included, of course, the item of Materials and Supplies amounting to $95,000.00. Eliminating this item from the debit side (assets to be realized) there is a difference of $8,500.00, which represents the loss on the realization proper, e.g. $8,000.00 by reason of bad debts written off, and $500.00 by reason of discounts and allowances on customers' accounts prior to January 1, 1908. In the problem, however, this difference was not carried out, but the supplementary charges and the supplementary credits respectively have been added and the net result of the trustee's operation shown in one sum.

In the trustee's operations proper, under "Supplementary Charges" and "Supplementary Credits," is shown the result of his operations, viz: To the total under supplementary charges, $356,695.00, is to be added the item of $3,000.00 for materials consumed from the inventory, making a total of $359,695.00. Against this the total of supplementary credits, after all the deductions are made, amounts to $338,135.00. That gives a loss on the trustee's operations, of $21,560.00. If we add to this the $8,500.00 lost on the realization proper, we get a total of $30,060.00, as shown in the last item on the credit side of the realization account. Under payments, the problem gives purchases of materials and supplies as $98,000.00. However, as under the item of notes given to creditors the amount of $180,000.00 is given, and the renewals are only $110,000.00 we must conclude that $70,000.00 worth of material was bought on notes; hence, the figure of $168,000.00 under purchases of materials and supplies, in the Supplementary Charges.

The balance sheet proves the condition shown by the realization and liquidation account. The item of cash is determined by adding to the difference found by subtracting the payments from the receipts, the balance of $450.00 on hand at the beginning of the trusteeship.

The item of notes receivable is found by subtracting the cash amount received, $13,500.00, from the item $20,000.00, "notes received from customers." In the same way the items of accounts receivable, notes payable and accounts payable are determined.

The items "accrued interest" and "accrued taxes," although charged as expenditures for the trusteeship, have not as yet actually been paid and are treated as *deferred* liabilities.

There is not much comment to be made on the solution of Problem 4. The transactions pertaining to the Fairview Real Estate Association are clearly ear-marked whether they appear in the journal or in the ledger, as are also the transactions relating to the Fairview Club.

The Massachusetts C. P. A. Law and Its First Results.

With the working out of the provisions of chapter 399 of the acts of 1909, Massachusetts takes a place in the list of states which provide for the examination and certification of Public Accountants.

The law provides not only for a thorough examination of all accountants applying for registration, but makes it a misdemeanor punishable by a fine not exceeding $500.00, or by imprisonment for a period not exceeding six months, or both, for any person falsely to represent himself to be a Registered Public Accountant under the provisions of the Massachusetts act.

This act for the registration of public accountants provides that the Bank Commissioner shall have charge of the registration, shall make such rules as are necessary to carry out the intent of the law, shall keep a record of all certificates issued, a duplicate of which shall be open for public inspection at the office of the Secretary of the Commonwealth.

The Bank Commissioner shall examine any citizen of the United States, resident in the Commonwealth, and not less than 21 years of age, who may apply for a certificate, shall investigate his character and fitness, and may require the payment of a reasonable and fixed fee, not to exceed $25.00, for each certificate granted.

Any applicant, whom said Commissioner deems to have the necessary qualifications and professional ability, shall be registered as a public accountant and shall receive a certificate thereof good for one year, which may be renewed from year to year upon the payment of $5.00 for each renewal.

The Commissioner has the power, after notice and a hearing, to suspend or revoke for good cause any certificate issued by him.

The rules for application for registration are as follows: All applications shall be filed with the Bank Commissioner on a blank form provided, at least 30 days prior to the date of taking an examination, and will be referred to a Board of Examiners appointed by the Commissioner. Applications will not be considered until they are completely and properly filled out. The names of unsuccessful applicants, or reasons for decisions on applications will not be made public.

The qualifications provide that the applicant must be of good moral character and repute and must pass a satisfactory examination on the following subjects: Theoretical and Practical Accounting, Auditing and Commercial Law, as applicable to accounting.

Examinations will take place as often as may be deemed necessary in the judgment of the examiners or the commissioner, but not less frequently than once a year, if there be applications.

Questions and answers will not be made public and all papers shall remain the property of the examiners and will not be open for public inspection.

Re-examination, in the event of an applicant failing to pass, may be given within such period as the examiners or the Bank Commissioner may determine.

The examination was held in November, 1909, and 45 applicants were successful out of some 60 examined, 50 certificates were issued to the following, the first five being the Board of Examiners appointed by the Bank Commissioner:

Edwin L. Doubleday.....432 Main Street, Springfield
G. Duthie Strachan.....59 Temple Place, Boston
Frederick L. Fuller.....37 Purchase Street, New Bedford
Herbert F. French.....166 Essex Street, Boston
Amos D. Albee.....53 State Street, Boston
Hollis H. Sawyer.....131 State Street, Boston
Horace L. Basset.....176 Federal Street, Boston
Gideon M. Mansfield.....53 State Street, Boston

Thomas L. Spurr.....258 Washington Street, Boston
William H. L. Jarvis.....27 State Street, Boston
Morgan L. Cooley.....73 Tremont Street, Boston
Gerald Wyman.....75 State Street, Boston
Walter C. Wrye.....84 State Street, Boston
Harold Arthur Marvin.....55 Magazine Street, Cambridge
Orlando C. Moyer.....39 Paul Gore Street, Jamaica Plain
James W. Hall.....Needham
Walter L. Boyden.....6 Beacon Street, Boston
Charles H. Tuttle.....84 State Street, Boston
Francis Oakey.....23 Babcock Street, East Milton
James D. Glunts.....35 Congress Street, Boston
George Lester Bishop.....161 Devonshire Street, Boston
Newman W. Storer.....161 Devonshire Street, Boston
Raymond G. Laird.....22 Rockview Street, Jamaica Plain
Henry N. Greely.....53 State Street, Boston
Hazen P. Philbrick.....161 Devonshire Street, Boston
Frederick B. Cherrington.....330 Old South Building, Boston
Charles C. Barron.....53 State Street, Boston
James T. Swan.....60 State Street, Boston
Edward Steacie.....6 Beacon Street, Boston
Asa E. Chandler.....905 Old South Building, Boston
Herbert E. Jacobs.....131 State Street, Boston
Gustavis H. Sparrow.....89 State Street, Boston
Myron E. Wood.....Webster, Mass.
Robert Douglas.....166 Essex Street, Boston
Augustus Nickerson.....53 State Street, Boston
Franklin Edwards.....Springfield
Charles Dyer Chase.....31 State Street, Boston
Walter W. Eaton.....318 Main Street, Springfield
Joseph Edward Masters.....60 State Street, Boston
George E. Crawford.....35 Congress Street, Boston
William H. Mannix.....15 State Street, Boston
Herbert H. Albee.....53 State Street, Boston
James P. Francis.....New Bedford
Charles H. Pope.....166 Essex Street, Boston
Clinton H. Scovell.....84 State Street, Boston
James L. Hathaway.....89 Campbell Street, New Bedford
Frederick J. Hillman.....31 Elm Street, Springfield
Gabriel Sanger.....166 Essex Street, Boston
J. Seymour Luther, Jr.....414 Fifth Street, Boston
Rupert L. Carven.....56 Baldwin Street, Boston

Banker and Tradesman, Feb. 5, 1910.